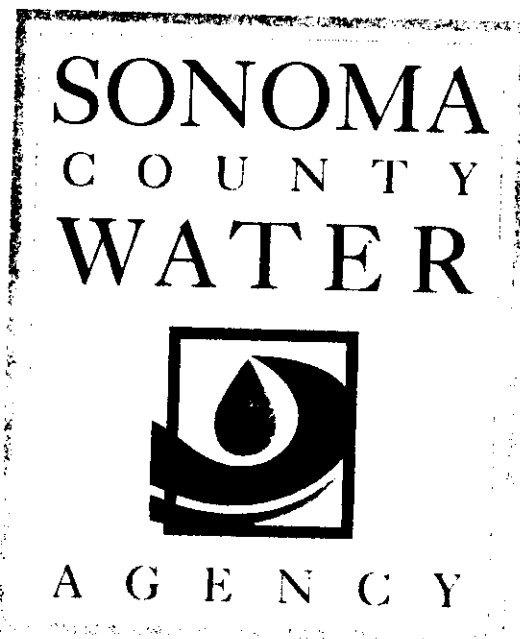


# URBAN WATER MANAGEMENT PLAN 2000



# CHAPTER 9

## Water Conservation Best Management Practices

**Water Code:** 10631 (f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

The Agency implements water conservation Best Management Practices (BMPs) and assists the water contractors in implementing water conservation programs. This chapter summarizes existing and proposed water conservation programs within the Agency's service area. Implementation status, implementation schedule, program effectiveness, and estimated water savings (where estimations are available) are described for each BMP for the Agency and each of the water contractors.<sup>1</sup> Appendix F (*BMP Activity Profile*) shows, in table format, the water conservation measures undertaken through June 2000 for each of the water contractors plus Marin Municipal Water District and the Town of Windsor.<sup>2</sup>

### SONOMA COUNTY WATER AGENCY – CONSERVATION BACKGROUND

Agency water conservation programs date back to 1982 as documented in previous Urban Water Management Plans. In 1995, the Agency commissioned a study of the cost-effectiveness of various water conservation measures that could be employed by each water contractor. The study, entitled "*Water and Wastewater Efficiency/Avoided Cost Study*"<sup>3</sup> (September 1995), determined the potential water savings, and economic costs and benefits of implementing BMPs within the Agency's service area. With the information provided by the "*Water and Wastewater Efficiency/Avoided Cost Study*," a Water Conservation Plan (WCP), was developed by the Agency. The WCP designated, subject to annual budget appropriations, approximately \$1.5 million annually, for a ten-year period (commencing FY 1997-98), to assist the water contractors in implementing cost-effective BMPs.<sup>4</sup> The WCP is funded through the Eleventh Amended Agreement (Appendix A).

In 1998, with funding in place to implement water conservation, the Agency became signatory to the California Urban Water Conservation Council's (CUWCC) Memorandum of Understanding (MOU) regarding urban water

---

<sup>1</sup> The water contractors provided information for completion of the BMP sections that describe their water conservation programs.

<sup>2</sup> Appendix F (BMP Activity Profile) was prepared by a separate contractor and may not exactly reflect the information provided by the water contractors.

<sup>3</sup> Montgomery Watson Americas, Inc. *Water and Wastewater Efficiency/Avoided Cost Study*. 1995

<sup>4</sup> The WCP was reviewed and accepted by the Sonoma County Water Agency Board of Directors on May 19, 1998

conservation.<sup>5</sup> By signing the MOU, the Agency agreed to develop and implement applicable BMPs using sound economic criteria. The BMPs and the criteria for their implementation are contained in the MOU, a copy of which is available through the CUWCC's website, [www.cuwcc.org](http://www.cuwcc.org).<sup>6</sup> As a signatory, the Agency pledges a "good faith effort" to implement applicable cost-effective water conservation efficiency improvements.<sup>7</sup> In addition, the Agency undertakes additional water conservation measures in its service area that benefit the water contractors. A list and description of the BMPs and water conservation measures that the Agency implements follows:

#### **Best Management Practices**

- BMP #03: System Water Audits, Leak Detection and Repair (required)
- BMP #06: High-Efficiency Washing Machine Rebate Programs
- BMP #07: Public Information Programs (required)
- BMP #08: School Education Programs (required)
- BMP #10: Wholesale Agency Assistance Programs (required)
- BMP #11: Conservation Pricing (required)
- BMP #12: Conservation Coordinator (required)

#### **Additional water conservation programs**

- Sonoma Valley County Sanitation District Toilet Replacement Program

### **AGENCY IMPLEMENTED BEST MANAGEMENT PRACTICES**

#### **BMP #03 – Systems Water Audits, Leak Detection And Repair**

**Implementation:** The Agency conducts a Standard Water System Maintenance Program (MP) that includes: a preventative maintenance program; a mainline valve exercise program; monthly main line and water contractor meter reading for billing; calibration of production and water contractor meters, audits and leak detection; and corrective maintenance. Annual scheduled hours for Agency crews are about 2,650 hours on meter calibration and aqueduct appurtenance. The MP ensures that in an emergency the Agency can isolate portions of the distribution system.

In cooperation with the Sonoma County Fire Services, the Agency complied with recent amendments to California Code of Regulations Title 19, Division 1, Chapter 9, pertaining to standardization of fire hydrants and associated fire protection equipment. The Agency meets or exceeds the minimum fire flow requirements, in accordance with California Water Works Standards. The Agency has available, on standby, pumps and generators to assist in water distribution in a disaster.

**Implementation Schedule:** The Agency has permanently incorporated this BMP into its Operations & Maintenance procedures.

---

<sup>5</sup> The CUWCC is made up of three groups. Group 1 consists of water suppliers. A "water supplier" is defined as any entity, including a city, which delivers or supplies water for urban use at the wholesale or retail level. Group 2 consists of public advocacy organizations and Group 3 consists of other interested groups.

<sup>6</sup> There are currently 14 BMPs addressing residential, commercial, industrial, landscape, system loss and leak detection, education, public information, and pricing conservation practices.

<sup>7</sup> The Agency, as a wholesale water supplier, is not expected to implement all BMPs; according to the MOU, wholesale water suppliers are not expected to implement BMPs that require direct end-user interventions.

**Program Effectiveness Evaluation:** There is no measurable unaccounted-for water in the Agency system. All water pumped is metered, stored, and distributed.

**Water Savings Assumptions:** The accuracy of monitoring devices is +/- 1.5 percent.

#### **BMP #06 – High-Efficiency Washing Machine Rebate Programs**

**Implementation:** The Agency has implemented a High-Efficiency Washing Machine Rebate Program on behalf of the water contractors since 1998. The Agency provides rebates for water conserving washing machines to water contractor residential water customers as an extension of the Pacific Gas and Electric (PG&E) Energy Rebate Program.

**Implementation Schedule:** The Energy Rebate Program will continue through December 31<sup>st</sup>, 2000 and the Agency will continue to offer the washing machine rebate during this time period. The Agency will investigate options for continuing the washing machine rebate program for water savings beyond December 31, 2000.

**Program Effectiveness Evaluation:** As of December 31, 1999, the Agency provided rebates for 2,732 washing machines for the water contractors with a cumulative water savings estimate of 36.9 acre feet per year (AFY) (12.0 million gallons a year (MGY)). Table 9 – 1 provides a breakdown, by water contractor, of washers rebated and estimated savings.

<b>Table 9 – 1</b>		
<b>Washing Machines Rebated and Water Savings</b>		
<b>Water Contractors</b>	<b>Washers Rebated</b>	<b>Estimated Water Savings (AFY)</b>
Santa Rosa	1,297	18.3
Rohnert Park	223	3.1
Cotati	51	0.7
Petaluma	409	5.7
North Marin Water District	518	5.8
Sonoma	115	1.6
Valley of the Moon Water District	106	1.5
Forestville Water District	13	0.2
<b>Total</b>	<b>2,732</b>	<b>36.9</b>

## **BMP #07 – Public Information Programs**

**Implementation:** In 1996 the Agency developed a draft Public Information and Communication Plan (PICP). Utilizing the PICP, the Agency's Public Information section developed and implemented programs to increase the knowledge and importance of water conservation and reclamation to children and adults in the community. A variety of programs were developed by the Agency to further public education and outreach. Appendix F (*BMP - Agency*) contains a detailed description of the programs implemented from 1997 through 2000.

**Implementation Schedule:** The Agency has implemented a variety of programs and will continue to provide public information services and materials to the public and water contractors.

**Program Effectiveness Evaluation:** While savings cannot be estimated for this BMP, the Agency and water contractors believe its implementation is an important aspect of promoting water conservation and conservation related benefits.

**Water Savings Assumptions:** Water savings have not been estimated for this measure. The programs implemented do not have direct, measurable water savings. The programs emphasize changing the behavior and habits of children and adults to use water efficiently.

## **BMP #08 – School Education Programs**

**Implementation:** The Water Education Program (WEP) was established in 1985 and has grown to 2 permanent full-time and 1 full-time temporary Water Information Specialists. The program is ongoing throughout the fiscal year and has developed into a comprehensive instructional and resource program.

The Agency offers the WEP, free of charge, to all public and private schools within the Agency's service area (grades kindergarten through 6). The program provides direct instruction both in the classroom and at the Russian River field-study site. The WEP also serves as a resource (technical support, materials, supplies and participation in events) for all education levels, as well as the adult community. This comprehensive program is designed to help educators teach students the value of water as an important natural resource. Through conservation efforts and education, participating youth will become responsible citizens promoting stewardship of their watershed to ensure an adequate, safe water supply for future generations. For a description of the Agency's Water Education activities please see *Appendix F (BMP - Agency)*.

**Implementation Schedule:** The Agency plans to continue implementing this BMP for itself and the water contractors.

**Program Effectiveness Evaluation:** While savings cannot be estimated for this BMP, the Agency and water contractors believe it is an important aspect of encouraging water conservation. Table 9 - 2 provides a breakdown, by water contractor, of students, schools, and classes that participated in the Agency's WEP from 1996 to 2000.

<b>Table 9 - 2:</b> <b>Water Education Program Participants</b> <b>(1996 – 2000)</b>			
<b>Water Contractor</b>	<b>Students</b>	<b>Schools</b>	<b>Classes</b>
Santa Rosa	11,687	48	459
Rohnert Park	5,552	11	221
Cotati	850	1	34
Petaluma	5,683	25	223
North Marin Water District	3,366	14	130
Sonoma	1,928	6	81
Valley of the Moon Water District	860	2	31
Forestville Water District	475	1	20
<b>TOTAL</b>	<b>30,401</b>	<b>108</b>	<b>1,199</b>

The Agency estimates an additional 48,593 people took advantage of the WEP through direct instruction, materials, and community outreach from 1996 through 2000.

**Water Savings Assumptions:** Water savings have not been estimated for this measure. The program does not have direct, measurable water savings. The program emphasizes changing the behavior and habits of children and adults to use water efficiently.

### **BMP #10 –Wholesale Agency Assistance Program**

**Implementation:** The Agency has been implementing a wholesale agency assistance program as funded under the Eleventh Amended Agreement. Since 1998, the Agency's Water Transmission System Fund has provided approximately \$2,000,000 annually for water conservation and water education programs, including a specific earmark of approximately \$1,500,000 annually for implementing cost-effective water conservation measures for water contractors in the Agency's service area.

In addition to providing monetary assistance, the Agency provides technical support and information to each water contractor on a regular basis and upon request. Agency staff is available to assist water contractors in workshops and conferences where technical representation is desired.

**Implementation Schedule:** The Agency will continue to fund water conservation, technical support, and water reuse<sup>8</sup> programs to reduce water demand on the Agency's water transmission system.

---

<sup>8</sup> Potential recycled water projects are analyzed in the report entitled, "Preliminary Assessment of Urban Water Reuse, Sonoma County Water Agency Service Area, Sonoma County and Marin County, California" (November 1999). This report is included as Appendix E (*Reuse Optimization Plan*) and summarized in Chapter 8 of this UWMP 2000.

**Program Effectiveness Evaluation:** The Water Advisory Committee (WAC) and Agency staff regularly review the efficiency of this BMP and makes changes accordingly.

**Water Savings Assumptions:** Water savings have not been estimated for this measure. The Agency works in cooperation with its water contractors to identify opportunities to encourage and reward cost-effective investments in long-term conservation shown to advance regional water supply reliability and sufficiency. In addition, a large portion of the savings identified in this chapter under each of the water contractors programs is attributable to this program.

### **BMP #11 – Conservation Pricing**

**Implementation:** The Agency is a wholesale water agency that sells water at a uniform rate to its eight retail water contractors.

### **BMP #12 – Conservation Coordinator**

**Implementation:** The Agency designated a full-time Water Conservation Coordinator in September 1999. The Coordinator is responsible for: coordination and oversight of conservation programs and BMP implementation; preparation and submittal of the CUWCC BMP Implementation Report; communication and promotion of water conservation issues to Agency management and other staff; preparation of annual conservation budget; preparation for annual conservation audit; and participation in the CUWCC. For a description of the Agency's Conservation staffing please see Appendix F (*BMP - Agency*).

**Implementation Schedule:** The Agency will continue to staff and maintain the position of conservation coordinator and provide support staff as necessary.

**Program Effectiveness Evaluation:** There is no formal method used by the Agency to evaluate the effectiveness of this measure. However, the successes of the other BMPs directly relate to the effectiveness of the water conservation coordinator and staff.

**Water Savings Assumptions:** Water savings have not been estimated for this measure. The Agency believes that the water conservation coordinator position is essential to providing quality conservation programs.

## **ADDITIONAL WATER CONSERVATION PROGRAMS**

### **Sonoma Valley County Sanitation District**

Conservation funding for the Sonoma Valley County Sanitation District (SVCSD) began in 1992. SVCSD is operated and maintained by the Agency and provides service to a number of communities including two water contractors: City of Sonoma (Sonoma) and the Valley of the Moon Water District (VOMWD). Expanding the initial funding, the SVCSD's Board of Directors created the Conservation Program (Program) with Ordinance No. 59 on August 1, 2000. SVCSD's Program Fund receives \$1,500 per equivalent single family dwelling (ESD) of the

sewer connection fee. Funding is available to design, implement, and monitor residential and/or non-residential water conservation programs that will reduce hydraulic inflow to the SVCSD treatment plant.

Examples of programs that are eligible for funding include, but are not limited to, residential and commercial water audit and incentive programs, low-flow toilet rebate and replacement programs, and, water efficient appliance replacement incentive programs. Research and analysis related to water conservation appliances, fixtures, programs and savings may also be funded by the SVCSD. It is anticipated that conservation programs implemented under the SVCSD will directly benefit Sonoma and VOMWD.

### **Residential ULFT Replacement Programs**

In 1996, the ultra-low flush toilet (ULFT) Replacement Program was established to offer a \$100 rebate for retrofitted toilets and free water efficient devices for all SVCSD customers. As of June 30, 2000, over 1,100 toilets and the associated devices have been retrofitted.

In 1996 and 1997, the SVCSD initiated two Toilet Giveaway Programs in cooperation with the City of Sonoma and the Valley of the Moon Water District. Approximately 1,700 free-of-charge, 1.6-gallon-per-flush toilets, and associated devices (showerheads, kitchen and bath faucet aerators) were distributed to residential water customers during a designated weekend. SVCSD donated \$15 per toilet to a non-profit group for volunteering with implementation of the program.

**Implementation Schedule:** SVCSD, under contract with the Agency, plans to continue funding the toilet replacement programs. The toilet replacement goal for FY 2000/01 is to replace 1,000 high-water-using toilets by offering participants one of two options for fixture replacement: Toilet Giveaway or Rebate.

**Program Effectiveness Evaluation:** The water savings to date are estimated to be 34.5 AFY (11.2 MGY). The estimated water savings are based on the "American Water Works Association Research Foundation North American Residential End Use Study."

**Water Savings Assumptions:** See program effectiveness evaluation, above.



## CITY OF SANTA ROSA

---

### **BMP #01 – Water Survey Programs For Single-Family & Multi-Family Residential Customers**

**Implementation:** The City of Santa Rosa (Santa Rosa) has completed the interior portion of this measure through the “Go Low Flow” program described below. Exterior water savings are being achieved in single-family residential sector through education and outreach. In the multi-family sector, outdoor use is primarily on dedicated irrigation meters in regards to BMP #05.

**Implementation Schedule:** The “Go Low Flow” Plumbing Incentive Program is available to all Santa Rosa utility customers and includes an interior audit and fixture upgrade for all participants (see BMP #14 for a complete program description). This program is marketed to the top water users with site surveys, payback period analysis, and availability of low-interest loans. To date, approximately 10,000 of the 38,000 single-family residential accounts have participated, and 1,888 of the 2,800 multi-family accounts have participated. Single-family residential exterior conservation is supported through utility bill inserts, site surveys on request, and water-wise gardening workshops. For multi-family residential exterior measures see BMP #05.

**Program Effectiveness Evaluation:** The program is effective for the two user classes and has resulted in significant sustainable savings. Santa Rosa will continue to implement this BMP.

**Water Savings Assumptions:** To date, Santa Rosa has saved 1,040.4 AFY (339 MGY) from residential participation in the “Go Low Flow” program. For details see Appendix F (*BMP – Santa Rosa*).

### **BMP #02 - Residential Plumbing Retrofit**

**Implementation:** Santa Rosa adopted an ultra-low flush toilet (ULFT) requirement for new and remodeled construction in June 1991, which was six months before the state requirements were in place. The “Go Low Flow” program requires replacement of showerheads and faucet aerators and each May all Santa Rosa utility customers are sent toilet leak detection kits.

**Implementation Schedule:** This BMP is completed, yet will continue to be implemented. Additionally, Santa Rosa intends to conduct a compliance survey to assess the number of low-flow showerheads and aerators in their service area.

**Program Effectiveness Evaluation:** Customer participation rates for the “Go Low Flow” program exceed the CUWCC MOU standard for this BMP. Santa Rosa will develop water use comparisons of the “Go Low Flow” participants versus a control group.

**Water Savings Assumptions:** Santa Rosa will perform a survey of existing homes and apartments in 2001 to determine the penetration of low flow showerheads and faucet aerators.

### **BMP #03 - System Water Audits, Leak Detection And Repair**

**Implementation:** Santa Rosa's distribution system is audited annually. The billing department notifies utility customers of potential leaks through screening increases in water use and contacting customers individually. Field staff responds to water waste calls and supports customers in finding the source of the leaks. Unaccounted for water is approximately 6 percent.

**Implementation Schedule:** Completed. Santa Rosa will continue to implement this BMP.

**Program Effectiveness Evaluation:** Based on an unaccounted water of approximately 6 percent, Santa Rosa considers this measure effective.

**Water Savings Assumptions:** Since the state average unaccounted for water is assumed to be 9 percent, it can be concluded that without an effective leak detection program, Santa Rosa would lose 3 percent more water through leaks and unmetered uses; which could require approximately 690.5 AFY (225 MGY) additional delivery to meet the same demand.

### **BMP #04 - Metering With Commodity Rates For All New Connections And Retrofit Of Existing Connections**

**Implementation:** Connections are metered; an ongoing meter testing/replacement/upgrade program assures proper meter registering. Please see BMP #11 for information on commodity rates.

**Implementation Schedule:** Completed. Santa Rosa will continue to implement this BMP.

**Program Effectiveness Evaluation:** It is estimated that metered accounts use 15 percent less water than unmetered accounts. It can be concluded that without metering Santa Rosa would need to provide 15 percent more water than is currently provided to supply all connections. Fifteen percent of Santa Rosa's annual delivery is 3,376 AFY (1,100 MGY).

**Water Savings Assumptions:** See previous discussion on program effectiveness evaluation.

### **BMP #05 – Large Landscape Conservation Programs And Incentives**

**Implementation:** Large landscape irrigation audits are available on request to any Santa Rosa utility customer. Santa Rosa encourages landscape professionals to obtain training in the State audit methods, so that local irrigators have the expertise to perform their own irrigation evaluations. Santa Rosa maintains a phone-in information line, Turf-Time 707-543-3466, which reports weekly evapotranspiration as recorded at the local CIMIS (California Irrigation Management Information Systems) stations #83 located at the Brown Farm on Llano Road, and #158 located at Bennett Valley Golf Course, Bennett Valley Road. Santa Rosa sponsors and maintains both

weather stations. In 1998, implementation of this BMP included the beginning of gathering of water use data for 1,100 dedicated irrigation meters and approximately 400 mixed-use commercial metered connections. In the summer of 2000, Santa Rosa measured landscaped areas for dedicated-irrigation metered accounts and began providing monthly irrigation goals to these accounts.

Santa Rosa has two new incentive programs. One of the incentive programs provides a rebate for splitting off irrigation water use from domestic meters. The other incentive program provides a rebate for documented efficient landscape water management to Santa Rosa customers irrigating landscape through a dedicated irrigation-only meter.

**Implementation Schedule:** Partially implemented: Audits are ongoing. Turf-Time has been in place since 1992. Landscape measurement collecting began mid-summer 2000. Santa Rosa reports water savings goals with a comparison to actual use as sites are measured.

**Water Savings Assumptions:** Santa Rosa projects a 5 percent savings for sites receiving monthly reports on water use in comparison to evapotranspiration based demand and a 15 percent savings for audited sites.

#### **BMP #06 – High-Efficiency Washing Machine Rebate Programs**

Please refer to Sonoma County Water Agency Water Conservation Programs, BMP #06.

#### **BMP #07 – Public Information Programs**

The Agency provides public information programs on behalf of the City of Santa Rosa in addition to Santa Rosa's programs. Please see Sonoma County Water Agency BMP #07.

**City of Santa Rosa Implementation:** Santa Rosa's public information program provides information to the public via distribution centers, radio, school contests, etc. For a more detailed list of the activities undertaken by Santa Rosa, please see *Appendix F (BMP - Santa Rosa)*.

**Implementation Schedule:** Completed: Santa Rosa will continue to implement this BMP.

**Program Effectiveness Evaluation:** Santa Rosa receives feedback from customers, conducts market surveys to test customers' knowledge of existing programs, and receives requests for additional information and materials from customers.

**Water Savings Assumptions:** Santa Rosa does not attribute actual savings to this BMP.

#### **BMP #08 – School Education Programs**

Please refer to Agency BMP #08. Table 9 – 3 provides a detailed summary of education outreach by year for Santa Rosa.

<b>Table 9 - 3</b>		
<b>School Education Program - City of Santa Rosa</b>		
<b>School Year</b>	<b>Students</b>	<b>Classes</b>
1999/2000	4,086	174
1998/1999	3,403	140
1997/1998	2,130	71
1996/1997	2,068	74
<b>Total:</b>	<b>11,687</b>	<b>459</b>

**City Of Santa Rosa Implementation:** Santa Rosa offers tours of the Santa Rosa Subregional Wastewater Reclamation System and distributes Water Education Calendars.

#### **BMP #09 – Conservation Programs For Commercial, Industrial, And Institutional Accounts**

**Implementation:** The “Go Low Flow” program had 445 participating Commercial, Industrial, Institutional (CII) accounts replacing over 2,207 toilets and the associated showerheads and faucet aerators; this represents 16 percent of the CII accounts. Santa Rosa performs site surveys for commercial customers; these include assessment of process water uses including cooling towers, rinse processes, etc. Since 1996, Santa Rosa has had financial incentives for industrial/commercial fixtures other than toilet/showerhead/aerator. This measure provides a rebate of \$100 per 1,000 gallons per month of sustainable savings for hardware or process changes. In 2000, Santa Rosa adopted a rebate for coin-operated clothes washers. This rebate provides \$450 for each coin-operated washer replaced with water efficient horizontal axis model.

**Implementation Schedule:** In Progress: Santa Rosa will continue to implement this BMP.

**Program Effectiveness Evaluation:** Program effectiveness is measured through a comparison of winter water use of program participants versus winter water use of a control group. Program participants use significantly less water than the control group during the winter; therefore, the program is evaluated as effective.

**Water Savings Assumptions:** As of July 7, 2000, estimated water savings in the commercial sector is 235.2 AFY (76.7 MGY).

#### **BMP #10 –Wholesale Agency Assistance Program**

Please refer to Sonoma County Water Agency Water Conservation Programs, BMP #10.

#### **BMP #11 - Conservation Pricing**

**Implementation:** Santa Rosa's rate structure has several effective conservation components: 1) approximately 86 percent of water and sewer revenues are generated from commodity charges, while 14 percent are from fixed charges, 2) water rates cover the cost of providing water service, and 3) sewer charges are based on metered water use.

As of January 1, 1996, the water and sewer demand fees for new connections are based on actual projected water demand or sewer flow. If a customer demonstrates highly efficient fixtures or processes, they're assessed lower demand fees.

**Implementation Schedule:** Completed: Santa Rosa will continue to implement this BMP.

**Program Effectiveness Evaluation:** A recent survey of adjacent cities shows that Santa Rosa has the lowest water use in the single family sector in Sonoma County. Santa Rosa attributes this to an aggressive conservation program and an effective rate structure.

**Water Savings Assumptions:** Water savings have not been estimated for this measure; please see program effectiveness evaluation, above.

#### **BMP #12 - Conservation Coordinator**

**Implementation:** A full time coordinator was hired in January 1991. A Water Conservation Technician was added to the conservation staff in June 1994; and a Water Conservation Representative was hired in January 1995, to implement the "Go Low Flow" Program. An additional Water Conservation Representative was added to staff in 1998 to implement BMP #05 and the exterior water use portion of BMP #01.

**Implementation Schedule:** Completed: Santa Rosa will continue to implement this BMP.

**Program Effectiveness Evaluation:** There is no formal method used by Santa Rosa to evaluate the effectiveness of this measure. However, the successes of the other BMPs directly relate to the effectiveness of the water conservation coordinator and staff.

**Water Savings Assumptions:** Water savings have not been estimated for this measure; please see program effectiveness evaluation, above.

#### **BMP #13 – Water Waste Prohibition**

**Implementation:** Water Waste Ordinance No. 3426 was adopted in 1999. The Ordinance prohibits water waste due to unattended open hoses, broken irrigation heads or lines, plumbing leaks, and excessive irrigation running off property or spraying on sidewalks or gutters. This ordinance is in compliance with this BMP. It also prohibits non-re-circulating ornamental fountains and other inefficient fixtures. A full time staff person responds to water

emergencies including water waste calls. During the summer of 2000, a Water Watch Patrol was initiated to monitor irrigation water waste and enforce the ordinance. Santa Rosa's Ordinance is contained in Appendix F (*BMP - Santa Rosa*).

**Implementation Schedule:** Completed: Santa Rosa will continue to implement this BMP.

**Program Effectiveness Evaluation:** A database has been established to track water waste reports.

**Water Savings Assumptions:** Water savings have not been estimated for this measure; please see program effectiveness evaluation, above.

#### **BMP #14 – Residential ULFT Replacement Programs**

**Implementation:** From 1992-1994, Santa Rosa performed a three phase pilot study to evaluate the effectiveness of toilet replacement with a rebate incentive for reducing water use and wastewater flows. This pilot study alone, with rebates of \$50-\$150 per toilet, resulted in 1,700 toilet replacements. In May 1994, the Board of Public Utilities and the City Council approved a 5-year, 3.5 million dollar citywide incentive program.

The "Go Low Flow" Program was launched May 1, 1995, and offers rebates of \$100 for toilet replacement and free water saving device (showerhead/faucet aerator) replacement to all utility customers.

**Implementation Schedule:** Santa Rosa will continue to offer the "Go Low Flow" Program.

**Program Effectiveness Evaluation:** As of May 2000, the citywide effort had over 11,488 participants changing a total of 25,933 toilets and the associated showerheads and faucet aerators. Analysis of winter water usage indicates that the combined effect of the pilot program and city efforts are resulting in a 1,040.0 AFY (339 MGY) reduction in water usage and associated wastewater flow.

**Water Savings Assumptions:** See program effectiveness evaluation, above. For water savings calculations, please see Appendix F (*BMP - Santa Rosa*)

### **BMP #01–Water Survey Programs for Single-Family & Multi-Family Residential Customers**

**Implementation:** The City of Petaluma (Petaluma) has developed a plan to implement a water survey program for 50 single-family residential customers. The top water using residential water consumers will be contacted by mail and offered a free on-site water survey and an opportunity to participate in an Evapotranspiration (ET) Paging Irrigation Controller Program. The Residential Water Survey Program costs and elements will be tracked and results summarized. For detailed information on BMP #01, refer to Appendix F (*BMP - Petaluma*).

**Implementation Schedule:** The Residential Water Survey Program began in August 2000 with a goal to audit 50 residential water customers. Petaluma plans to continue implementation of the program. For detail on the implementation schedule refer to Appendix F (*BMP - Petaluma*).

**Program Effectiveness Evaluation:** Effectiveness of the Residential Water Survey Program will be monitored and measured using water billing data for accounts served by the program. A comparison of "before" and "after" water use will be gathered and evaluated.

**Water Savings Assumptions:** Water savings have not been estimated for this measure. See program effectiveness evaluation, above, for the proposed method for calculating savings in the future.

### **BMP #02 - Residential Plumbing Retrofit**

**Implementation:** Petaluma has not established a program for the distribution of low flow showerheads, toilet displacement devices, toilet flappers, and faucet aerators. Some of these devices are distributed at the annual Sonoma-Marin Fair and are available year-round at City Hall. Approximately 3,000 low flow showerheads and 1,500 hose-end faucets have been given away in the past two years.

**Implementation Schedule:** This BMP has not been formalized as a program and has no implementation schedule. It is anticipated that water conserving devices and publications will continue to be made available to the public on a first-come, first-serve basis.

**Program Effectiveness Evaluation:** Approximately 50 water conserving devices are distributed weekly from City Hall. Other than the popularity of these items, no formal evaluation of their effectiveness in conserving water has been conducted.

**Water Savings Assumptions:** Water savings have not been estimated for this measure.

### **BMP #03 - System Water Audits, Leak Detection and Repair**

**Implementation:** Petaluma has an active Leak Detection Program, which has proven to be cost effective. Using City of Petaluma personnel, the distribution system is surveyed for leaks every three years. Field staff responds to water waste calls, supports customers in finding the source of the leaks, and repairs detected leaks on Petaluma mains. Monthly audits are performed to account for all water purchased from the Agency and sold to Petaluma's customers.

**Implementation Schedule:** Petaluma will continue to implement this BMP.

**Program Effectiveness Evaluation:** This program has proven to be cost effective. Each survey cycle has found at least one leak large enough that the water saved paid for the cost of the survey. While the industry average unaccounted-for water is approximately 9 percent, Petaluma averages approximately 6 percent.

**Water Savings Assumptions:** Since the state average unaccounted for water is assumed to be 9 percent, it can be concluded that without an effective leak detection program, Petaluma would lose 3 percent more water through leaks and unmetered uses; which would require approximately 336 AFY (109.5 MGY) additional delivery to meet the same demand.

### **BMP #04 - Metering with Commodity Rates for all new Connections and Retrofit of Existing Connections**

**Implementation:** Petaluma meters all water bought and sold and customers are billed by volume of use. All active connections are metered, and an ongoing meter testing, replacement, and upgrade program assures proper meter registering.

**Implementation Schedule:** Petaluma will continue to implement this BMP.

**Program Effectiveness Evaluation:** Petaluma can confirm that all new and existing service connections are metered and are being billed by volume of use. It is estimated that metered accounts use 15 percent less water than unmetered accounts. It can be concluded that without metering Petaluma would need to provide 15 percent more water than is currently delivered to supply all connections. Fifteen percent of annual deliveries in 2000 was 1,680 AFY (547.4 MGY).

**Water Savings Assumptions:** See discussion on program effectiveness evaluation, above.



## **BMP #05 – Large Landscape Conservation Programs and Incentives**

**Implementation:** Petaluma is implementing Large Landscape Conservation Programs and Incentives for non-residential water customers. Program components include use of local evapotranspiration data, landscape education, water audits, and incentives for irrigation efficiency. Please refer to Appendix F (*BMP -Petaluma*) for additional program detail.

**Implementation Schedule:** The residential Water Audit program began in Petaluma in 2000 and Petaluma will continue to implement this BMP as it is described by CUWCC's MOU. Please refer to Appendix F (*BMP - Petaluma*) for a detailed implementation schedule.

**Program Effectiveness Evaluation:** The first year water savings is estimated to be 5.1 AFY (1.7MGY). With program participants increasing in the second year, it is assumed that the water savings will also increase.

**Water Savings Assumptions:** Savings from program effectiveness evaluation, above, were calculated by evaluating the program participants "before" and "after" water use and the size of the irrigated landscape.

## **BMP #06 – High-Efficiency Washing Machine Rebate Programs**

Please refer to Sonoma County Water Agency Water Conservation Programs, BMP #06.

## **BMP #07 – Public Information Programs**

The Agency provides public information programs on behalf of the City of Petaluma in addition to Petaluma's programs. Please refer to Agency BMP #07.

**City of Petaluma Implementation:** Petaluma's public information program consists of coordinating conservation efforts with other local agencies, televised water conservation messages and participation at local events. For a more detailed list of Petaluma's Public Information activities please see Appendix F (*BMP - Petaluma*).

**Water Savings Assumptions:** Petaluma does not attribute actual savings to this BMP.

## **BMP #08 – School Education Programs**

Please refer to Agency BMP #08. Table 9 – 4, on the following page, provides a detailed summary of education outreach by year for Petaluma.

**City of Petaluma Implementation:** The City of Petaluma Water Education Program consists of tours of Petaluma's Wastewater Treatment Facility.

<p><b>Table 9 - 4</b> <b>School Education Program - City of Petaluma</b></p>
--

School Year	Students	Classes
1999/2000	1,805	79
1998/1999	1,298	58
1997/1998	1,650	55
1996/1997	930	31
<b>Total:</b>	<b>5,683</b>	<b>223</b>

## **BMP #09 – Conservation Programs for Commercial, Industrial, and Institutional Accounts**

**Implementation:** Petaluma has two conservation programs for Commercial, Industrial, and Institutional (CII) accounts: Non-Residential Toilet Replacement Program and a customized Commercial/Industrial Water Survey and Incentive Program.

### **Toilet Replacement Program**

The Non-Residential Toilet Replacement Program offers applicants two options for toilet replacement.

1. Direct-Install Option, where free fixtures (ULFTs, showerheads and aerators) are supplied and installed by a City-hired contractor.
2. Rebate Option, for customers who prefer to buy colored or custom-style equipment from a supplier and/or want to use their own contractor or qualified in-house maintenance personnel. Rebates are \$100 for a gravity-flush toilet and \$150 for a commercial-type power flush toilet.

1,825 toilets have been replaced through the Non-residential Toilet Replacement Program.

### **Customized Commercial/Industrial Water Survey and Incentive Program**

The customized Commercial/Industrial Water Survey and Incentive Program is being developed through experience gained at selected demonstration projects. Petaluma's program will have the ability to consistently develop projects that save water and money. Innovations for accomplishing these goals, include:

1. High-quality technical designs that follow a protocol beginning with process optimization.
2. Long-term partnerships that encourage proper operation and maintenance of optimized systems (not just new equipment).
3. Monitoring and verification of savings.
4. Savings normalized for economic protection.
5. Full valuation of avoided water and wastewater costs.

Customized Commercial and Industrial Incentive Programs have been developed at two sites to date.

The specific industrial water-use elements of the facilities, potential water savings, methods to achieve water savings, and appropriate incentives were evaluated and reported to Petaluma.

**Implementation Schedule:** Petaluma will continue to implement the two programs in this BMP. Please refer to Appendix F (*BMP - Petaluma*) for a detailed implementation schedule.

### **Program Effectiveness Evaluation:**

Non-Residential Toilet Replacement

The annual water savings from the 1,825 toilets replaced is estimated to be 62.3 AFY (20.3 MGY). Water savings was calculated using 1997 and 1998 billing data and the "before" and "after" water use was compared. Supplementing and supporting this approach were actual end-use measurements at local CII sites using a digital data logger attached to the customer's water meter.

#### **Industrial Survey & Incentives**

The estimated water savings from the Commercial/Industrial Water Survey and Incentive Program's two demonstration projects is 11 AFY (3.6 MGY). The magnitude of potential water and wastewater savings were determined through a detailed engineering audit.

**Water Savings Assumptions:** The estimated water savings from both programs is 73.3 AFY (23.9 MGY). It is anticipated that the savings will improve as the program continues.

#### **BMP #10 –Wholesale Agency Assistance Program**

Please refer to Sonoma County Water Agency Water Conservation Programs, BMP #10.

#### **BMP #11 - Conservation Pricing**

**Implementation:** All Petaluma water and sewer service uses a uniform rate schedule based on metered water use. The pricing includes rates designed to recover the cost of providing service plus the cost of the water.

**Implementation Schedule:** Petaluma will continue to use uniform rate schedules but will look to implement tiered rates in the near future.

**Program Effectiveness Evaluation:** Since 1989, Petaluma has generated a report showing the annual revenue and water consumption by customer type.

**Water Savings Assumptions:** Water savings have not been estimated for this measure.

#### **BMP #12 - Conservation Coordinator**

**Implementation:** Petaluma has entered into an agreement with the Agency to supply the City with 1.5 full time Water Conservation Specialist positions. At the present time Petaluma is in the third year of the contract. The Water Conservation Specialists, who are assisted by a City of Petaluma Department of Water Resource and Conservation employee, are responsible for all coordination and oversight of conservation programs, BMP implementation, and communication and promotion of water conservation issues to City of Petaluma staff.

**Implementation Schedule:** Petaluma has budgeted to hire a full time Conservation Coordinator in FY 2001-2002.

**Program Effectiveness Evaluation:** Effectiveness is reflected by the implementation of other BMPs in the City of Petaluma.

**Water Savings Assumptions:** This BMP cannot be quantified; however, savings from implementation of all other BMPs is contingent upon having water conservation coordination and staff.

### **BMP #13 – Water Waste Prohibition**

**Implementation:** Petaluma is in the process of updating its Ordinance. The Ordinance is in draft form and is closely modeled after the Model Water Waste Prohibition Ordinance included in Appendix F.

### **BMP #14 – Residential ULFT Replacement Programs**

**Implementation:** Petaluma implements toilet replacement programs for single-family and multi-family residents. The program began with a Special Event Fundraiser Program in 1999 and will continue with two toilet replacement programs in the coming year- the Special Event Fundraiser Program and the Rebate Program. The Special Event Fundraiser Program includes free-of-charge, 1.6 gallon-per-flush toilets, faucet aerators, and low-flow showerheads given to residential water customers during a designated weekend. Petaluma donates \$15 per toilet to a non-profit group(s) for working with Petaluma on this program. The Rebate Program consists of rebates of \$100 per toilet paid to participants who purchase and install their own toilet fixtures.

**Implementation Schedule:** Petaluma will continue to implement this BMP and has a goal of replacing 7,000 residential high-water-using toilets.

**Program Effectiveness Evaluation:** Approximately 1,000 high water using toilets were replaced as a result of the first Special Event Fundraiser Program. The estimated water savings from the Special Event are 12.39 AF. The water savings, when all 7,000 high-water-using toilets are replaced, are expected to be 86.7 AFY (28.3 MGY). The estimates are based on the "American Water Works Association Research Foundation North American Residential End Use Study."

**Water Savings Assumptions:** See program effectiveness evaluation, above.

## NORTH MARIN WATER DISTRICT

---

### **BMP #01–Water Survey Programs for Single-Family & Multi-Family Residential Customers**

**Implementation:** The North Marin Water District's (NMWD) residential water use survey program for single-family residential customers began January 2000. In May 2000, 12,000 single-family residential customers were mailed a newsletter explaining NMWD conservation programs. The newsletter included individual specific water use information during the prior year as compared to a typical single-family residential customer.

Customers who participate in the fixture retrofit program, described in BMP #02 and BMP #14 of this section, receive individual inspection of their plumbing fixtures and free showerheads, faucet aerators and trigger hose nozzles. These devices are packaged in a NMWD bucket (suitable for other uses such as car washing). Please refer to Appendix F (*BMP - NMWD*) for additional program details.

**Implementation Schedule:** In 1999, NMWD began implementing the Residential Water Use Survey Program. An expanded program is proposed for FY 2002-2003 with a goal of completing 100 audits per year. Please refer to Appendix F (*BMP - NMWD*) for a detailed implementation schedule.

**Program Effectiveness Evaluation:** The program will be monitored and measured using water billing data. A "before and after" data comparison will be gathered and evaluated.

**Water Savings Assumptions:** Water savings have not been estimated for this measure.

### **BMP #02 - Residential Plumbing Retrofit**

**Implementation:** In January 2000, NMWD implemented an at-time-of-property-resale toilet and fixture replacement program and a voluntary fixture replacement and toilet rebate program. NMWD requires that all homes built prior to 1977 and sold in the Novato service area upgrade their toilets to use no more than 3.5 gallons per flush, showerheads to use no more than 2.5 gallons per minute, and faucet aerators to use no more than 2.2 gallons per minute (NMWD provides rebates of \$50 per toilet and free showerheads and faucet aerators as needed). During the 1999-2000 retrofit program, 500 showerheads and 650 sink aerators were distributed.

**Implementation Schedule:** NMWD will continue to implement these programs.

**Program Effectiveness Evaluation:** Combined, the programs have certified 175 homes through June 2000.

**Water Savings Assumptions:** Water savings have not been estimated for this measure. An evaluation of water savings will be completed in 2001.

### **BMP #03 - System Water Audits, Leak Detection and Repair**

**Implementation:** NMWD performs a prescreening system water loss calculation annually, and throughout the last decade, water loss has been less than 10 percent. NMWD notifies customers of leaks on customer side of the meter, responds to high bill complaints and searches for leaks and assists customers with leak repair under the "screwdriver maintenance" programs. NMWD also has a replacement plan for polybutylene (PB) service lines that have a history of premature failure. To date, NMWD has replaced approximately 2,540, of a total 6,559, PB service lines.

**Implementation Schedule:** NMWD will continue with its water audits, leak detection and repair programs.

**Program Effectiveness Evaluation:** Based on water losses of less than 10 percent, NMWD considers this program effective.

**Water Savings Assumptions:** Water savings have not been estimated for this measure.

### **BMP #04 - Metering with Commodity Rates for all new Connections and Retrofit of Existing Connections**

**Implementation:** All 18,372 water connections in the NMWD service area are metered and billed based on volume of use. NMWD regulations specify initial charges and facility reserve charges. These charges are based on the water use in Novato equivalent for a single-family dwelling (ESD) on the average day of the peak month, currently 636 gallons for an equivalent dwelling unit.

**Implementation Schedule:** All water connections in the NMWD service area are metered and billed based on volume of use. NMWD will continue to require and install meters at each new connection. In addition, meters are regularly checked and are replaced when not operating properly.

**Program Effectiveness Evaluation:** It is estimated that metered accounts use 15 percent less water than unmetered accounts. It can be concluded that without metering NMWD would need to provide 15 percent more water than is currently delivered to provide supply to all connections. Fifteen percent of annual production in 2000 was 1,854 AFY (604 MGY).

**Water Savings Assumptions:** See discussion on program effectiveness evaluation, above.

### **BMP #05 – Large Landscape Conservation Programs and Incentives**

**Implementation:** NMWD is implementing a Large Landscape Conservation Program (Landscape Program). The Landscape Program includes: training; landscape water budgeting; auditing; and an incentive. Please refer to Appendix F (*BMP - NMWD*) for additional program details.

**Implementation Schedule:** NMWD will continue implementing this BMP, and expects to expand implementation in the future. Please refer to Appendix F (*BMP - NMWD*) for a detailed program implementation schedule.

**Program Effectiveness Evaluation:** Irrigation Audit/Budget Training session effectiveness will be evaluated based on the number of participants that complete the session and take the irrigation auditor test. Landscape Auditing and Budgeting Programs will be evaluated by comparing water use before and after participation in the program.

**Water Savings Assumptions:** Water savings have not been estimated for this measure. There is no data available at this time.

### **BMP #06 – High-Efficiency Washing Machine Rebate Programs**

Please refer to Sonoma County Water Agency Water Conservation Programs, BMP #06.

### **BMP #07 – Public Information Programs**

The Agency provides public information programs on behalf of the NMWD in addition to the District's programs. Please refer to Agency BMP #07.

**North Marin Water District Implementation:** NMWD's public information programs consist of media marketing, participation in public events, and direct mail letters. For further detail regarding the NMWD Public Information activities please see Appendix F (*BMP - NMWD*).

**Water Savings Assumptions:** NMWD does not attribute actual savings to this BMP.

### **BMP #08 – School Education Programs**

Please refer to Agency BMP #08. Table 9 – 5, on the following page, provides a detailed summary of education outreach by year for NMWD.

**NMWD Implementation:** The NMWD Water Education Program consists of tours of the Stafford Plant facilities and District laboratory.

**Water Savings Assumptions:** NMWD does not attribute actual savings to this BMP.

<b>Table 9 - 5</b>
--------------------

<b>School Education Program - North Marin Water District</b>		
<b>School Year</b>	<b>Students</b>	<b>Classes</b>
1999/2000	806	37
1998/1999	790	34
1997/1998	750	25
1996/1997	1,020	34
<b>Total:</b>	<b>3,366</b>	<b>130</b>

### **BMP #09 – Conservation Programs for Commercial, Industrial, and Institutional Accounts**

**Implementation:** NMWD does not currently implement a Commercial, Industrial, Institutional (CII) water conservation program but plans to begin implementation in FY 2002/03. CII water users currently consume approximately 20 percent of the Novato supply.

**Schedule Of Implementation:** NMWD plans to develop and implement a CII water conservation program in FY 2002/03. Implementation will continue until NMWD is fully compliant with BMP #09 as described in the CUWCC's MOU.

**Program Effectiveness Evaluation:** The program(s) will be evaluated using a before and after comparison of water use.

**Water Savings Assumptions:** Water savings have not been estimated for this measure.

### **BMP #10 –Wholesale Agency Assistance Program**

Please refer to Sonoma County Water Agency Water Conservation Programs, BMP #10.

### **BMP #11 - Conservation Pricing**

**Implementation:** Current pricing of water recovers the cost of providing service. Water commodity rates are structured by elevation zones. Elevation zones allow higher commodity rates to be charged to zones with higher pumping and storage costs. Local sewer charges are also based on water use. NMWD provides customer water use histories to the local sanitary district for this purpose. All customers within an elevation zone are charged a uniform commodity rate for metered water use.

**Schedule Of Implementation:** This BMP is completed and the policy is implemented by regulation.

**Program Effectiveness Evaluation:** For over 26 years NMWD has utilized uniform commodity rates effectively.

**Water Savings Assumptions:** Water savings have not been estimated for this measure.



### **BMP #12 - Conservation Coordinator**

**Implementation:** NMWD contracted with the Agency on September 21, 1999, to provide a Program Manager for the NMWD Water Conservation Program. The Program Manager reports to NMWD's General Manager.

**Schedule Of Implementation:** NMWD plans to hire a full time Water Conservation Coordinator by FY 2005.

**Program Effectiveness Evaluation:** Water savings have not been estimated for this measure; however, water savings from specific programs detailed in this section is contingent upon program coordination and staff.

**Water Savings Assumptions:** See program effectiveness evaluation, above.

### **BMP #13 – Water Waste Prohibition**

**Implementation:** North Marin Water District Regulation 15b contains a Waste Water Prohibition Ordinance. The Ordinance is contained in Appendix F (*BMP - NMWD*).

**Schedule Of Implementation:** Regulation 15b was completed as of June 2000. NMWD will continue to implement this BMP.

**Program Effectiveness Evaluation:** A database will be established to track water waste reports.

**Water Savings Assumptions:** Water savings have not been estimated for this measure.

### **BMP #14 – Residential ULFT Replacement Programs**

**Implementation:** NMWD replaces high water use toilets with ultra-low flush toilets (ULFTs) in single family and multi-family residences. Two programs include an at-time-of-property-resale toilet and fixture replacement program and a voluntary fixture replacement and toilet rebate program. The at-time-of-property-resale toilet and fixture replacement program requires all toilets in the Novato service area that flush more than 3.5 gallons per flush be replaced with ULFTs at the time of property sale (per Regulation 15(M)). Rebates in the amount of \$50 per toilet are available to participants. The voluntary fixture replacement and toilet rebate program rebates customers \$50 per toilet when all 3.5 or more gallons per flush toilets in the household are replaced with ULFTs.

**Implementation Schedule:** NMWD's goal is to replace 8,000 toilets through their toilet replacement programs by the year 2005. It is estimated that savings will be 4,473 gallon/toilet/year with a total savings of 110 AFY (35.7 MGY). Please refer to Appendix F (*BMP - NMWD*) for implementation details.

**Program Effectiveness Evaluation:** Water savings will be calculated using a comparison of before and after water use for participants in the program. Savings data may be skewed by the fact that a majority of the houses

participating in the toilet rebate are required to replace per the at-time-of-property-resale toilet and fixture replacement program discussed above and under BMP #02.

**Water Savings Assumptions:** Total water saving from the projected 8,000 toilet replacements is estimated to be 110 AFY (35.7 MGY). This estimate is based on the "American Water Works Association Research Foundation North American Residential End Use Study."

### **BMP #01 – Water Survey Programs for Single-Family & Multi-Family Residential Customers**

**Implementation:** The City of Sonoma (Sonoma) has plans to study and implement a pilot water survey program for single-family residential customers. The top 10 percent of residential water customers will be contacted by mail and offered a free on-site water survey. A percentage of the customers who sign up may be eligible for a free ET Paging Irrigation Controller Program. The Residential Water Survey Program costs and elements will be tracked and results summarized.

**Implementation Schedule:** Sonoma plans to implement the Pilot Water Survey Program in FY 2002-2003.

**Program Effectiveness Evaluation:** Program effectiveness will be monitored and measured using water billing data for accounts served by the program or a comparison of water use between program participants and a control group.

**Water Savings Assumptions:** Potential water savings have not been estimated for this measure.

### **BMP #02 - Residential Plumbing Retrofit**

**Implementation:** Sonoma participates in the distribution of showerheads and aerators at the County fair, during Water Awareness Month and at the Sonoma Boys and Girls Club Earth Day Celebration.

**Implementation Schedule:** Sonoma will continue to distribute fixtures in its service area. In addition, Sonoma plans to target 10 percent of the single family and multi-family homes every two years, beginning with the top 10 percent of water using residential accounts and pre-1992 single and multi-family customers.

**Program Effectiveness Evaluation:** Savings will be evaluated, calculated, and reported pursuant to the requirements of the California Urban Water Conservation Councils MOU regarding water conservation.

**Water Savings Assumptions:** Water savings have not been estimated for this measure.

### **BMP #03 - System Water Audits, Leak Detection and Repair**

**Implementation:** Sonoma's billing department notifies water customers of potential leaks through screening increases in water use and contacting customers individually. Field staff responds to water waste calls and supports customers in finding the source of the leaks, or leaves an "OOPS" high water use tag for the customer. Unaccounted for water is less than 8 percent.

**Implementation Schedule:** Sonoma will continue to implement this BMP.

**Program Effectiveness Evaluation:** Based on an unaccounted for water of less than 8 percent, Sonoma considers this measure effective.

**Water Savings Assumptions:** Because the state average unaccounted for water is assumed to be 9 percent, it can be concluded that the leak detection program has allowed Sonoma to save 1 percent or approximately 196.1 AFY (63.9 MGY).

#### **BMP #04 - Metering with Commodity Rates for all new Connections and Retrofit of Existing Connections**

**Implementation:** Connections are metered; an ongoing meter testing/replacement/upgrade program assures proper meter registering.

**Implementation Schedule:** Sonoma will continue to implement this BMP.

**Program Effectiveness Evaluation:** It is estimated that metered accounts use 15 percent less water than unmetered accounts. It can be concluded that without metering Sonoma would need to provide 15 percent more water than is currently delivered to supply all connections. Fifteen percent of annual delivery is 368.1 AFY (119.9 MGY).

**Water Savings Assumptions:** See discussion on program effectiveness evaluation.

#### **BMP #05 – Large Landscape Conservation Programs and Incentives**

**Implementation:** Sonoma began a large landscape conservation program during the fall of 2000. The landscape program is in a planning stage at this point in time; however, components of the program include landscape audits for up to 10 City-owned parks or turf areas and an irrigation efficiency course for landscape professionals. For additional details regarding this program refer to Appendix F (*BMP - Sonoma*).

In addition, Sonoma will undertake a cooperative satellite irrigation controller study to estimate potential water savings from new technology that automatically operates residential irrigation controllers according to localized weather conditions. City of Sonoma staff will work cooperatively with the Valley of the Moon Water District staff and a chosen consultant to implement this pilot program in FY 2000/01.

**Implementation Schedule:** Sonoma receives weekly reports of evapotranspiration as recorded at California Irrigation Management Information Systems (CIMIS) station #164, located at the Sonoma Mission Inn Golf Course in Aqua Caliente, California. Sonoma will be exploring how to best provide the evapotranspiration data to the landscape and residential community with plans of incorporating this into the landscape program in FY 2001/02. Sonoma plans to continue implementing this BMP and will be expanding the existing program.

**Water Savings Assumptions:** Potential water savings have not been estimated for this measure.

### **BMP #06 – High-Efficiency Washing Machine Rebate Programs**

Please refer to Sonoma County Water Agency Water Conservation Programs, BMP #06.

### **BMP #07 – Public Information Programs**

The Agency provides public information programs on behalf of the City of Sonoma in addition to the City's programs. Please refer to Agency BMP #07.

**City of Sonoma Implementation:** Sonoma's public awareness program began in the winter of 2000 with a goal of increasing customer awareness and acceptance of water conservation practices that will reduce water demand. Awareness measures to be undertaken include development of water conservation advertisements to be used in Sonoma's service area; development of newsletters highlighting local water demand, conservation issues, and achievements; development and distribution of direct-mail letters to residential customers; and a variety of community outreach programs.

**Water Savings Assumptions:** Sonoma does not attribute actual savings to this BMP.

### **BMP #08 – School Education Programs**

Please refer to Agency BMP #03. Table 9 – 6 provides a detailed summary of education outreach by year for Sonoma.

<b>Table 9 - 6</b>		
<b>School Education Program - City of Sonoma</b>		
<b>School Year</b>	<b>Students</b>	<b>Classes</b>
1999/2000	758	32
1998/1999	750	35
1997/1998	330	11
1996/1997	90	3
<b>Total:</b>	<b>1,928</b>	<b>81</b>

### **BMP #09 – Conservation Programs for Commercial, Industrial, and Institutional Accounts**

**Implementation:** Sonoma plans to undertake a pilot Commercial, Industrial, Institutional (CII) Program in cooperation with the Sonoma Valley County Sanitation District (SVCSO) within the next two years.

**Implementation Schedule:** If determined to be cost-effective after analysis of the pilot program, Sonoma will continue to cooperate with the SVCSO in implementation of the program(s).

**Program Effectiveness Evaluation:** The program(s) will be evaluated, calculated and reported pursuant to the requirements of the CUWCC's MOU.

**Water Savings Assumptions:** Potential water savings have not been estimated for this measure.

#### **BMP #10 –Wholesale Agency Assistance Program**

Please refer to Sonoma County Water Agency Water Conservation Programs, BMP #10.

#### **BMP #11 - Conservation Pricing**

**Implementation:** Sonoma currently has a 2-tiered rate system to encourage conservation. Approximately 90 percent of water revenues are generated from commodity charges, while 10 percent are from fixed charges; rates alone cover the cost of providing service.

**Implementation Schedule:** Sonoma is funding a rate study to implement a 3<sup>rd</sup> tier. An implementation schedule will be formed when the study is complete and additional information is available.

**Program Effectiveness Evaluation:** There is no formal method used by Sonoma to evaluate the effectiveness of this BMP.

**Water Savings Assumptions:** Water savings have not been estimated for this measure.

#### **BMP #12 - Conservation Coordinator**

**Implementation:** Sonoma contracted with the Sonoma County Water Agency on November 7, 2000 to provide a Program Manager for the City of Sonoma's Water Conservation Program. The Program Manager reports to Sonoma's Director of Public Works and will work closely with identified staff and committees and/or commissions to administer and develop program measures.

**Implementation Schedule:** It is anticipated that the Program Manager will continue to work with Sonoma so long as funding is available through the Agency.

**Program Effectiveness Evaluation:** There is no formal method used by Sonoma to evaluate the effectiveness of this BMP; however, staffing allows for implementation of a number of effective programs.

**Water Savings Assumptions:** Potential savings from the programs to be implemented are directly attributable to coordination and staffing of the programs. Please refer to other BMPs for a description of programs.

#### **BMP #13 – Water Waste Prohibition**

**Implementation:** Sonoma established Section 13.04.024 of the Municipal Code, entitled "Water Waste Prohibitions" in May 2000. The Municipal Code is actively enforced.

**Implementation Schedule:** Sonoma has permanently incorporated this BMP into its Ordinance.

**Program Effectiveness Evaluation:** Sonoma intends to establish a database to track water waste reports.

**Water Savings Assumptions:** Water savings have not been estimated for this measure.

#### **BMP #14 – Residential ULFT Replacement Programs**

**Implementation:** Sonoma cooperates with the SVCSD and the VOMWD in implementing a program for replacing existing high-water-using toilets with ultra-low flush toilets (ULFTs) in single-family and multi-family residents. Three Special Event Fundraiser Program toilet replacement programs were implemented, and others are planned. The Special Event Fundraiser Programs includes, free-of-charge, 1.6-gallon-per-flush toilets, faucet aerators, and low-flow showerheads. Sonoma donated \$15 per toilet to a non-profit group(s) for working with the City of Sonoma on this program.

**Implementation Schedule:** Sonoma will continue to implement this BMP cooperatively with SVCSD; it is anticipated that the next Special Event Fund Raiser Program will occur in Spring 2001.

**Program Effectiveness Evaluation:** 855 toilets were distributed to customers of the City of Sonoma during the three Special Event Fundraisers. Water savings are estimated to be 10.5 AFY (3.4 MGY). The estimated water savings are based on the "American Water Works Association Research Foundation's North American Residential End Use Study."

**Water Savings Assumptions:** See program effectiveness evaluation, above.

## VALLEY OF THE MOON WATER DISTRICT

---

### **BMP #01 – Water Survey Programs for Single-Family & Multi-Family Residential Customers**

**Implementation:** The Valley of the Moon Water District (VOMWD) does not yet implement this BMP. Future plans focus on the top 20 percent of water users in each sector.

### **BMP #02 - Residential Plumbing Retrofit**

**Implementation:** The VOMWD participates in the distribution of showerheads, aerators, and toilet tank leak detection tablets throughout the year at the VOMWD office. In addition, these items are distributed at Earth Day events and during Water Awareness Month. At these events, VOMWD also promotes the ultra-low-flush toilet (ULFT) replacement program (refer to BMP #14).

**Implementation Schedule:** This BMP is partially implemented. VOMWD distributed 2,502 showerheads and 3,548 aerators to single-family customers and 935 showerheads and 1,326 aerators to multi-family customers. VOMWD will continue to implement this BMP.

**Program Effectiveness Evaluation:** This program is effective for single-family and multi-family residential customers.

**Water Savings Assumptions:** Water savings have not been estimated for this measure.

### **BMP #03 - System Water Audits, Leak Detection and Repair**

**Implementation:** VOMWD's billing department responds to customers with potential leaks through screening increases in water use. Field staff responds to water waste calls and tells customers they have a leak. Unaccounted for water is less than 8 percent. VOMWD also has a replacement plan for polybutylene (PB) service lines that have a history of premature failure. To date some 4,050 linear feet of a total of 52,000 linear feet of PB service lines have been replaced.

**Implementation Schedule:** Completed. VOMWD will continue to implement this BMP.

**Program Effectiveness Evaluation:** Based on an unaccounted water of less than 8 percent, VOMWD considers this BMP effective.

**Water Savings Assumptions:** Because the state average unaccounted water is assumed to be 9 percent, it can be concluded that the leak detection program has allowed the VOMWD to save 1 percent or approximately 248.6 AFY (81 MGY).

### **BMP #04 - Metering with Commodity Rates for all new Connections and Retrofit of Existing Connections**



**Implementation:** Connections are metered; an ongoing meter testing/replacement/upgrade program assures proper meter registering.

**Implementation Schedule:** Completed: VOMWD will continue to implement this BMP.

**Program Effectiveness Evaluation:** It is estimated that metered accounts use 15 percent less water than unmetered accounts. It can be concluded that without metering VOMWD would need to provide 15 percent more water than is currently delivered to provide supply to all connections. Fifteen percent of annual delivery is 466.5 AFY (152 MGY).

**Water Savings Assumptions:** See program effectiveness evaluation, above.

### **BMP #05 – Large Landscape Conservation Programs and Incentives**

**Implementation:** VOMWD installed a CIMIS station (#164) at the Sonoma Mission Inn Golf Course, Aqua Caliente, California. Daily climatic data (temperature, relative humidity, wind velocity, and precipitation) is made available on a telephone recording for the public and through the VOMWD website. VOMWD encourages landscape professionals to obtain training in the State audit methods, so that local irrigators (landscape and agricultural) have the expertise to perform their own irrigation evaluations.

VOMWD is considering an incentive program to encourage high water users to convert to more water efficient landscapes. Incentives may include: irrigation system conversions, automatic controllers, soil moisture sensors and automated CIMIS scheduling. For example, VOMWD will undertake a cooperative satellite irrigation controller study to estimate potential water savings from new technology that automatically operates residential irrigation controllers according to localized weather conditions. VOMWD staff will work cooperatively with the City of Sonoma staff and a chosen consultant to implement this pilot program in FY 2000/01.

**Implementation Schedule:** VOMWD will continue to implement this BMP and has future plans to offer evaluations to customers whose total water use exceeds their total annual water budget. VOMWD will target and work with the parks department and the school district to improve water use efficiency at public landscapes.

**Water Savings Assumptions:** Landscapes that are upgraded based on future survey recommendations could result in a 15 percent reduction in water demand.

### **BMP #06 – High-Efficiency Washing Machine Rebate Programs**

Please refer to Sonoma County Water Agency Water Conservation Programs, BMP #06.

### **BMP #07 – Public Information Programs**

The Agency provides public information programs on behalf of the Valley of the Moon Water District in addition to the VOMWD programs. Please refer to Sonoma County Water Agency BMP #07.

**Valley of the Moon Water District Implementation:** VOMWD maintains a public information display in District headquarters stocked with various conservation publications and devices. These materials are available upon request to community groups and individuals at no cost to the customer. VOMWD sends materials to all customers upon request; includes past year's usage on utility bill; and provides speakers to local community groups (Valley of the Moon Boys and Girls Club, Sonoma Veterans Building and the "Got Water" Conference). VOMWD participates in an annual Water Awareness Month campaign, including: issuing Water Conservation Certificate awards, placing newspaper and television advertisements (Channel 8) to promote key programs; and coordinating with wholesale supplier and other utilities (e.g. PG&E).

**Water Savings Assumptions:** VOMWD does not attribute actual savings to this BMP.

### **BMP #08 – School Education Programs**

The Agency provides School Education Programs on behalf of the Valley of the Moon Water District. Please see Agency BMP #08. Table 9 – 7 provides a detailed summary of education outreach by year for VOMWD.

<b>Table 9 - 7</b>		
<b>School Education Program - Valley of the Moon Water District</b>		
<b>School Year</b>	<b>Students</b>	<b>Classes</b>
1999/2000	550	20
1998/1999	70	2
1997/1998	120	4
1996/1997	120	5
<b>Total:</b>	<b>860</b>	<b>31</b>

### **BMP #09 – Conservation Programs for Commercial, Industrial, and Institutional Accounts**

**Implementation:** VOMWD plans to identify the top 10 percent of commercial customers and the top 20 percent of industrial and institutional customers. VOMWD plans to contact these customers by letter, followed with telephone calls, to offer audits. Audits may be coordinated and cost-shared with the SVCSD.

VOMWD also plans to undertake a pilot CII program in cooperation with the Sonoma Valley County Sanitation District (SVCSD) within the next five years.

**Implementation Schedule:** If determined to be cost-effective after analysis of the pilot program, VOMWD may elect to continue to cooperate with the SVCSD in implementation of the program(s).

**Program Effectiveness Evaluation:** The program(s) will be evaluated, calculated and reported pursuant to the requirements of the CUWCC's MOU.

**Water Savings Assumptions:** Potential water savings have not been estimated for this measure.

#### **BMP #10 –Wholesale Agency Assistance Program**

Please refer to Sonoma County Water Agency Water Conservation Programs, BMP #10.

#### **BMP #11 - Conservation Pricing**

**Implementation:** VOMWD pricing has 90 percent of water revenues generated from commodity charges, while 10 percent are from fixed charges; rates alone cover the cost of providing service. As of 1999, the water fees for new connections are based on the equivalent single-family dwelling (ESD) actual projected water demands for commercial; single-family homes over 4,000 sq. ft. or 2,500 sq. ft. of spray irrigated landscaped area. If a customer demonstrates highly efficient fixtures or processes, they are assessed lower demand fees.

**Implementation Schedule:** Completed. VOMWD will continue to implement this BMP.

**Program Effectiveness Evaluation:** VOMWD has no formal mechanism for monitoring the success of this measure.

**Water Savings Assumptions:** Water savings have not been estimated for this measure.

#### **BMP #12 - Conservation Coordinator**

**Implementation:** VOMWD designated a part-time water conservation coordinator in 1997. VOMWD also contracts with consultants to implement other BMPs.

**Implementation Schedule:** VOMWD will continue to implement this BMP.

**Program Effectiveness Evaluation:** There is no formal method used by VOMWD to evaluate the effectiveness of this BMP; however, staffing allows for implementation of a number of effective programs.

**Water Savings Assumptions:** Potential savings from the programs to be implemented are directly attributable to coordination and staffing of the programs. Please refer to other BMPs for a description of programs and savings.

#### **BMP #13 – Water Waste Prohibition**

**Implementation:** VOMWD established "Water Waste" Prohibition ordinance No. 1007 in June 2000. The ordinance is actively enforced. The Ordinance is contained in Appendix F (*BMP - VOMWD*).

**Implementation Schedule:** VOMWD has permanently incorporated this BMP into its ordinance.

**Program Effectiveness Evaluation:** VOMWD intends to establish a database to track water waste reports.

**Water Savings Assumptions:** Water savings have not been estimated for this measure.

#### **BMP #14 – Residential ULFT Replacement Programs**

**Implementation:** VOMWD established an ultra-low flush toilet (ULFT) program in 1996. Rebates of \$100 per toilet are offered. All of the VOMWD facilities have ULFTs, urinals, and showerheads. VOMWD also co-sponsored, with the City of Sonoma and the SVCSD, three Special Event Fund Raiser Program toilet distributions. VOMWD distributed 1,532 toilets to customers during these events.

**Implementation Schedule:** VOMWD will continue to implement this BMP until 80 percent of all non-conserving toilets in the VOMWD service area are replaced with ULFT models. It is anticipated that the next Special Event Fund Raiser Program will occur in Spring 2001.

**Program Effectiveness Evaluation:** 1,532 toilets were distributed to customers of the VOMWD as a result of the three Special Event Fundraisers and the rebate program. Water savings is estimated to be 18.9 AFY (6.2 MGY). The estimated water savings are based on the "American Water Works Association Research Foundation's North American Residential End Use Study."

### **BMP #01 – Water Survey Programs for Single-Family & Multi-Family Residential Customers**

**Implementation:** Not currently implemented.

### **BMP #02 - Residential Plumbing Retrofit**

**Implementation:** Although the City of Cotati (Cotati) has not formalized a program for the distribution of low flow showerheads, toilet flappers, and faucet aerators; these devices are distributed, free of charge, at Cotati City Hall.

**Implementation Schedule:** There is no implementation schedule but Cotati plans to continue distribution of conservation devices as described above.

**Program Effectiveness Evaluation:** The effectiveness of this program has not been analyzed.

**Water Savings Assumptions:** Water savings have not been estimated for this measure.

### **BMP #03 - System Water Audits, Leak Detection and Repair**

**Implementation:** Cotati's distribution system is monitored for leaks on an on-going basis. Cotati's billing department notifies water customers of leaks and contacts customers individually and field staff responds to water waste calls.

**Implementation Schedule:** Completed. Cotati will continue to implement this BMP.

**Program Effectiveness Evaluation:** Unaccounted for water data is unavailable from Cotati and/or unknown at this time.

**Water Savings Assumptions:** Unknown, see program effectiveness evaluation, above.

### **BMP #04 - Metering with Commodity Rates for all New Connections and Retrofit of Existing Connections**

**Implementation:** Connections are metered; an ongoing meter testing/replacement/upgrade program assures proper meter registering.

**Implementation Schedule:** Completed: Cotati will continue to implement this BMP.

**Program Effectiveness Evaluation:** It is estimated that metered accounts use 15 percent less water than unmetered accounts. It can be concluded that without metering Cotati would need to provide 15 percent more

water than is currently delivered to provide supply to all connections. Fifteen percent of annual delivery in year 2000 is 176.7 AFY (57.6 MGY).

**Water Savings Assumptions:** See program effectiveness evaluation, above.

#### **BMP #05 – Large Landscape Conservation Programs and Incentives**

**Implementation:** This program is not currently being implemented.

**Implementation Schedule:** Cotati is currently negotiating with the Agency to provide funding for implementation of a Large Landscape Conservation Program. The Agency anticipates that this program could be implemented in FY 2001/02.

**Program Effectiveness Evaluation:** There is currently no mechanism used to evaluate the potential effectiveness of this program.

**Estimated Water Savings:** Potential water savings have not been estimated for this measure.

#### **BMP #06 – High-Efficiency Washing Machine Rebate Programs**

Please refer to Sonoma County Water Agency Water Conservation Programs, BMP #06.

#### **BMP #07 – Public Information Programs**

The Agency provides public information programs on behalf of Cotati in addition to Cotati's programs. Please refer to Sonoma County Water Agency BMP #07.

**City of Cotati Implementation:** Cotati maintains a public information display in City Hall stocked with conservation publications and devices. These materials are available upon request at no cost to the customer.

**Program Effectiveness Evaluation:** Cotati will implement a system to track public commentary regarding the information provided.

**Water Savings Assumptions:** Cotati does not attribute actual savings to this BMP.

#### **BMP #08 – School Education Programs**

The Agency provides School Education Programs on behalf of the City of Cotati. Please refer to Agency BMP #08. Table 9 – 8, on the following page, provides a detailed summary of education outreach by year for Cotati.

<b>Table 9 - 8</b>		
<b>School Education Program - City of Cotati</b>		
<b>School Year</b>	<b>Students</b>	<b>Classes</b>
1999/2000	130	8

1998/1999	270	11
1997/1998	180	6
1996/1997	270	9
<b>Total:</b>	<b>850</b>	<b>34</b>

#### **BMP #09 – Conservation Programs for Commercial, Industrial, and Institutional Accounts**

**Implementation:** This program is not currently being implemented and no additional information was available from the City of Cotati.

#### **BMP #10 –Wholesale Agency Assistance Program**

Please refer to Sonoma County Water Agency Water Conservation Programs, BMP #10.

#### **BMP #11 - Conservation Pricing**

**Implementation:** Information regarding this BMP is unavailable from Cotati and/or unknown at this time.

#### **BMP #12 - Conservation Coordinator**

**Implementation:** Information regarding this BMP is unavailable from Cotati and/or unknown at this time. However, Agency staff is available to assist Cotati in implementation of water conservation programs, please refer to Sonoma County Water Agency Water Conservation Programs, BMP #10.

#### **BMP #13 – Water Waste Prohibition**

**Implementation:** Cotati is in the process of updating its Ordinance. The Agency anticipates Cotati's Ordinance to be modeled after the Model Water Waste Prohibition Ordinance included in Appendix F.

#### **BMP #14 – Residential ULFT Replacement Programs**

**Implementation:** Cotati has provided a direct install low flush toilet replacement program since 1995. This is an on-going program. Additional information regarding this BMP is unavailable from Cotati and/or is unknown at this time.

## FORESTVILLE WATER DISTRICT

---

### **BMP #01 – Water Survey Programs for Single-Family & Multi-Family Residential Customers**

**Implementation:** Not currently implemented and information regarding implementation is unavailable from Forestville Water District (FWD) and/or is unknown at this time.

### **BMP #02 - Residential Plumbing Retrofit**

**Implementation:** Not currently implemented and information regarding implementation is unavailable from FWD and/or is unknown at this time.

### **BMP #03 - System Water Audits, Leak Detection and Repair**

**Implementation:** FWD notifies utility customers of potential leaks through screening increases in water use and contacting customers individually.

**Implementation Schedule:** Completed. FWD will continue to implement this BMP.

**Program Effectiveness Evaluation:** Unaccounted for water is unavailable from FWD and/or is unknown at this time.

**Water Savings Assumptions:** Unknown, see program effectiveness evaluation, above.

### **BMP #04 - Metering with Commodity Rates for all new Connections and Retrofit of Existing Connections**

**Implementation:** Connections are metered.

**Implementation Schedule:** Completed: FWD will continue to implement this BMP.

**Program Effectiveness Evaluation:** It is estimated that metered accounts use 15 percent less water than unmetered accounts. It can be concluded that without metering FWD would need to provide 15 percent more water than is currently delivered to provide supply to all connections. Fifteen percent of annual deliveries in year 2000 is 72 AFY (23.5 MGY).

**Water Savings Assumptions:** See program effectiveness evaluation, above.



**BMP #05 – Large Landscape Conservation Programs and Incentives**

**Implementation:** Not currently implemented and information regarding implementation is unavailable from FWD and/or is unknown at this time.

**BMP #06 – High-Efficiency Washing Machine Rebate Programs**

Please refer to Sonoma County Water Agency Water Conservation Programs, BMP #06.

**BMP #07 – Public Information Programs**

The Agency provides public information programs on behalf of the Forestville Water District. Please refer to Agency BMP #07.

**BMP #08 – School Education Programs**

The Agency provides School Education Programs on behalf of the Forestville Water District. Please refer to Agency BMP #08. Table 9 – 9 provides a detailed summary of education outreach by year for Forestville Water District.

<b>Table 9 - 9</b>		
<b>School Education Program - Forestville Water District</b>		
<b>School Year</b>	<b>Students</b>	<b>Classes</b>
1999/2000	195	6
1998/1999	100	5
1997/1998	180	9
1996/1997	0	0
<b>Total:</b>	<b>475</b>	<b>20</b>

**BMP #09 – Conservation Programs for Commercial, Industrial, and Institutional Accounts**

**Implementation:** Not currently implemented and information regarding implementation is unavailable from FWD and/or is unknown at this time.

**BMP #10 –Wholesale Agency Assistance Program**

Please refer to Sonoma County Water Agency Water Conservation Programs, BMP #10.

**BMP #11 - Conservation Pricing**

**Implementation:** Unknown and information regarding implementation is unavailable from FWD and/or is unknown at this time.

#### **BMP #12 - Conservation Coordinator**

**Implementation:** Not currently implemented and information regarding implementation is unavailable from FWD and/or is unknown at this time. However, Agency staff is available to assist FWD in implementation of water conservation programs, please refer to Sonoma County Water Agency Water Conservation Programs, BMP #10.

#### **BMP #13 – Water Waste Prohibition**

**Implementation:** FWD is in the process of updating their Water Waste Prohibition Ordinance. The Agency anticipates FWD's Ordinance to be modeled after the Model Water Waste Prohibition Ordinance included in Appendix F.

#### **BMP #14 – Residential ULFT Replacement Programs**

**Implementation:** Not currently implemented and information regarding implementation is unavailable from FWD and/or is unknown at this time.

## **CITY OF ROHNERT PARK**

---

### **BMP #01 – Water Survey Programs for Single-Family & Multi-Family Residential Customers**

**Implementation:** The City of Rohnert Park (Rohnert Park) does not currently offer water use surveys to single-family or multi-family residential customers. An evaluation may be undertaken to analyze the cost-effectiveness of implementing this BMP at a later date.

### **BMP #02 - Residential Plumbing Retrofit**

**Implementation:** A program for targeting and marketing the distribution of low-flow showerheads, toilet displacement devices, toilet flappers, and faucet aerators has not been implemented in Rohnert Park. Low flow devices are distributed, free of charge, at special events within Rohnert Park and are available year round at City facilities. In addition, low flow fixtures are available through Rohnert Park's Toilet Replacement Program (see BMP #09 and #14).

**Implementation Schedule:** This BMP has not been scheduled for implementation but devices will remain available to Rohnert Park customers.

**Program Effectiveness Evaluation:** The effectiveness of distributing low-flow devices has not been evaluated and savings have not been calculated.

**Water Savings Assumptions:** Water savings have not been estimated for this measure.

### **BMP #03 - System Water Audits, Leak Detection and Repair**

**Implementation:** Rohnert Park does not currently implement this BMP. Leaks are addressed and repaired on an as-needed basis.

**Implementation Schedule:** Rohnert Park will implement this BMP in the future as budget priorities allow.

### **BMP #04 - Metering with Commodity Rates for all new Connections and Retrofit of Existing Connections**

**Implementation:** Commercial, Industrial, Institutional, (CII) and multi-family dwelling units are metered and billed by volume of use. Since 1992, Rohnert Park has required meter installation on all new development but does not bill based upon volume of use. Rohnert Park, in conjunction with the Agency, is currently developing a plan to install meters on all unmetered connections and to adjust the billing system to more easily handle volume of use billing.

**Implementation Schedule:** A Water Meter Installation Plan for Rohnert Park is being developed. It is expected that all connections will be metered by FY2005 and that billing based on volume will begin in FY2006.

**Program Effectiveness Evaluation:** The Water Meter Installation Plan will provide a tool for analyzing the effectiveness of this BMP. It is assumed that water savings will be approximately 20 percent<sup>9</sup>. Twenty percent of Rohnert Park's annual potable water use in 2000 was 7,640 AF (2,489.4 MG).

**Water Savings Assumptions:** Potential water savings of greater than 7,640 AF are assumed; see program effectiveness evaluation, above.

#### **BMP #05 – Large Landscape Conservation Programs and Incentives**

**Implementation:** In 1995, the Rohnert Park began a landscape conservation program. In addition to encouraging efficient use of potable water on the landscape, Rohnert Park encourages irrigation of large landscapes with recycled water. Many lawn (turf grass) areas existing at schools, parks, and private companies within the City of Rohnert Park do not depend on potable water supplies; rather, they take advantage of recycled water from the Santa Rosa Subregional Wastewater Reclamation Facility. Rohnert Park considers this an effective program as over 250 acres within Rohnert Park are currently irrigated with recycled water.

**Implementation Schedule:** Rohnert Park does not plan to implement this BMP as it is described by the CUWCC's MOU. However, Rohnert Park will continue to encourage the use of recycled water as a means to irrigate large landscapes and conserve potable water supplies.

A future analysis of the effectiveness of implementing this BMP may be conducted for large landscapes not utilizing recycled water.

**Program Effectiveness Evaluation:** Rohnert Park's recycled water program is considered effective at offsetting potable water use. In 2000, approximately 973 AF (317.1 MG) of potable water was offset with recycled water.

**Water Savings Assumptions:** The savings estimation of 138 AFY is based upon the assumption that potable water would have been used for irrigation of the applicable landscapes had recycled water not been available and its use encouraged.

#### **BMP #06 – High-Efficiency Washing Machine Rebate Programs**

Please refer to Sonoma County Water Agency Water Conservation Programs, BMP #06.

#### **BMP #07 – Public Information Programs**

The Agency provides public information programs on behalf of the City of Rohnert Park. Please refer to Agency BMP #07.

## **BMP #08 – School Education Programs**

**Implementation:** The Agency provides School Education Programs on behalf of the City of Rohnert Park. Please refer to Agency BMP #08. Table 9 – 10 provides a detailed summary of education outreach by year for Rohnert Park.

<b>Table 9 - 10</b>		
<b>School Education Program - City of Rohnert Park</b>		
<b>School Year</b>	<b>Students</b>	<b>Classes</b>
1999/2000	1,247	53
1998/1999	1,090	57
1997/1998	2,105	74
1996/1997	1,110	37
<b>Total:</b>	<b>5,552</b>	<b>221</b>

## **BMP #09 – Conservation Programs for Commercial, Industrial, and Institutional Accounts**

**Implementation:** Rohnert Park began implementing a Commercial, Industrial, and Institutional (CII) Toilet Replacement Program in 1997. The program offers participants two ways to replace existing toilets: rebate or direct installation. Necessary faucet aerators are also made available to participants.

**Implementation Schedule:** Rohnert Park is committed to implementing this program through FY 2000-2001 and plans to continue to implement it until 900 toilets are replaced.

**Program Effectiveness Evaluation:** To date, approximately 465 toilets have been replaced through the Program. Water savings are estimated to be 15.9 AFY (5.2 MGY). Potential savings from this program when 900 toilets have been replaced is estimated to be 30.8 AFY (10.0 MGY).

**Water Savings Assumptions:** Water savings, noted under Program Effectiveness above, were estimated with assumptions derived from the "The City of Rohnert Park's 1997 Toilet Replacement Program."<sup>10</sup>

## **BMP #10 –Wholesale Agency Assistance Program**

Please refer to Sonoma County Water Agency Water Conservation Programs, BMP #10.

---

<sup>9</sup> An evaluation of savings achieved through meter installation programs for alternative northern California cities provided the basis for this estimation.

<sup>10</sup> A copy of this report is available for review at the Sonoma County Water Agency.

### **BMP #11 - Conservation Pricing**

**Implementation:** Rohnert Park does not currently implement this BMP but is preparing a Water Meter Plan (Plan) for installation of meters and a revised billing system. The Plan will evaluate implementation of an increasing block rate to encourage conservation.

**Implementation Schedule:** Water meters will likely be installed on all connections by FY 2005 with conservation pricing beginning in FY 2006.

**Water Savings Assumptions:** Water savings attributable to conservation pricing will be estimated in the Water Meter Plan that Rohnert Park is developing in conjunction with the Agency.

### **BMP #12 - Conservation Coordinator**

**Implementation:** Rohnert Park does not currently employ a full-time water conservation coordinator. However, Rohnert Park contracts with the Agency to implement a water conservation program where Agency staff is designated as Program Manager. In addition, a City of Rohnert Park employee is designated to oversee water conservation as a portion of their position responsibility.

**Implementation Schedule:** Rohnert Park will continue to utilize Agency staff to implement water conservation programs and has no formalized plan to hire a designated Conservation Coordinator.

**Program Effectiveness Evaluation:** Implementation of the existing water conservation programs is a measure of coordination effectiveness. Please refer to other BMPs.

### **BMP #13 – Water Waste Prohibition**

**Implementation:** Section 6 of Ordinance No. 76, adopted by the City in 1967, prohibits the waste of water. Rohnert Park may discontinue water service to a customer whose use of water is wasteful or negligent if such conditions are not corrected within five (5) days after giving the customer written notice and the waste seriously affects the general service.

Resolution 91-191, adopted by the Rohnert Park in 1991, established water efficient landscape guidelines. The purpose of the guidelines is to effect efficient water use through proper landscape design and management.

**Implementation Schedule:** Rohnert Park is updating the Water Waste Prohibition Ordinance. The Agency anticipates Rohnert Park's Ordinance to be modeled after the Model Water Waste Prohibition Ordinance included in Appendix F (*Model Water Waste Prohibition Ordinance*).

**Program Effectiveness Evaluation:** No measure of effectiveness is currently used to evaluate this BMP.

**Water Savings Assumptions:** Water savings have not been estimated for this measure.

#### **BMP #14 – Residential ULFT Replacement Programs**

**Implementation:** Rohnert Park began implementing a Residential Toilet Replacement Program in 1997. The program offers participants two ways to replace existing toilets: rebate or direct installation. Necessary showerheads and faucet aerators are also made available to participants.

**Implementation Schedule:** Rohnert Park is committed to implement this program through FY 2000/2001 and will continue to implement it until 14,100 toilets are placed..

**Program Effectiveness Evaluation:** As of April 2000, approximately 7,819 toilets have been replaced through the program. Water savings are estimated to be 96.3 AFY (31.4 MGY). When 14,100 toilets are replaced savings are estimated to be 173.7 AFY (56.6 MGY).

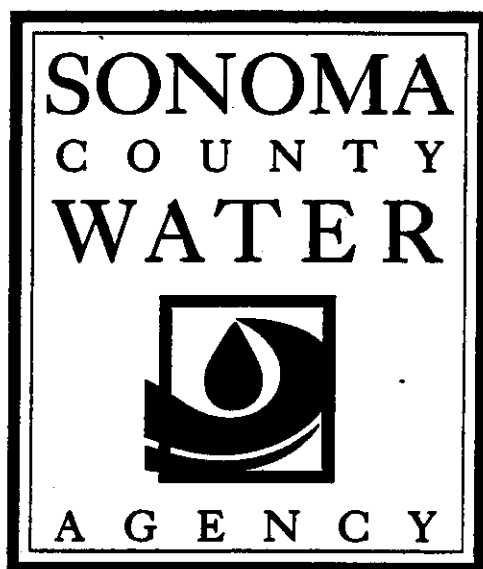
**Water Savings Assumptions:** Water savings are based on "The American Water Works Association Research Foundation Residential End Uses of Water Study."

## **Appendix E**

### **Reuse Optimization Plan**



**Preliminary Assessment of Urban Water Reuse**  
**Sonoma County Water Agency Service Area**  
**Sonoma County and Marin County, California**



**November 1999**

## TABLE OF CONTENTS

LIST OF TABLES .....	iii
LIST OF ILLUSTRATIONS .....	iii
EXECUTIVE SUMMARY .....	iv
1.0 INTRODUCTION .....	1
1.1 Scope of Assessment .....	2
1.2 Water Reuse Regulations .....	2
1.3 Water Supply Agreement .....	4
1.4 Report Organization .....	4
2.0 FORESTVILLE WATER DISTRICT .....	4
2.1 Water Use Summary .....	4
2.2 Prospective Water Reuse Sites .....	4
2.3 Recycled Water Source .....	5
2.4 Recycled Water Distribution .....	5
3.0 NORTH MARIN WATER DISTRICT .....	5
3.1 Water Use Summary .....	5
3.2 Prospective Water Reuse Sites .....	5
3.3 Recycled Water Source .....	6
3.4 Recycled Water Distribution .....	6
4.0 CITY OF PETALUMA .....	6
4.1 Water Use Summary .....	6
4.2 Prospective Water Reuse Sites .....	6
4.3 Recycled Water Source .....	7
4.4 Recycled Water Distribution .....	7
5.0 CITY OF COTATI AND ROHNERT PARK .....	7
5.1 Water Use Summary .....	7
5.2 Prospective Water Reuse Sites .....	8
5.3 Recycled Water Source .....	8
5.4 Recycled Water Distribution .....	8
6.0 CITY OF SANTA ROSA .....	9
6.1 Water Use Summary .....	9
6.2 Prospective Water Reuse Sites .....	9
6.3 Recycled Water Source .....	9
6.4 Recycled Water Distribution .....	10

## TABLE OF CONTENTS - continued

---

7.0 CITY OF SONOMA AND VALLEY OF THE MOON WATER DISTRICT.....	10
7.1 Water Use Summary.....	10
7.2 Prospective Water Reuse Sites.....	10
7.3 Recycled Water Source .....	11
7.4 Recycled Water Distribution.....	11
8.0 SUMMARY.....	12
9.0 CONCLUSIONS .....	13

TABLES

ILLUSTRATIONS

## **LIST OF TABLES**

---

Table 1	Summary of Estimated Recycled Water Use and Costs
Table 2	Estimated Costs, Urban Water Reuse, Forestville Water District
Table 3	Estimated Costs, Urban Water Reuse, North Marin Water District
Table 4	Estimated Costs, Urban Water Reuse, City of Petaluma
Table 5	Estimated Costs, Urban Water Reuse, City of Cotati and City of Rohnert Park
Table 6	Estimated Costs, Urban Water Reuse, City of Santa Rosa
Table 7	Estimated Costs, Urban Water Reuse, City of Sonoma and Valley of the Moon Water District

## **LIST OF ILLUSTRATIONS**

---

Figure 1	Sonoma County Water Agency Service Area
Figure 2	Conceptual Layout, Recycled Water Distribution System, Forestville Water District
Figure 3	Conceptual Layout, Recycled Water Distribution System, North Marin Water District
Figure 4	Conceptual Layout, Recycled Water Distribution System, City of Petaluma
Figure 5	Conceptual Layout, Recycled Water Distribution System, City of Rohnert Park and City of Cotati
Figure 6	Conceptual Layout, Recycled Water Distribution System, City of Santa Rosa
Figure 7	Conceptual Layout, Recycled Water Distribution System, City of Sonoma and Valley of the Moon Water District

## EXECUTIVE SUMMARY

Demands on the Agency's water supply and transmission system have been increasing at a rate of about 2 million gallons per day (mgd) each year. As a result of these increases, the Agency's water supply system is operating near its capacity during peak water use periods. In June, 1999, the Agency notified its water contractors that the Agency's water supply and transmission system was operating near its capacity and that an additional 24 million gallon (MG) of potable water storage was needed to meet industry standards for storage during current peak water use periods.

The use of recycled water for irrigation in urban areas has the potential to reduce the peak summer demands on the Agency's water supply system and the need to construct additional potable water storage facilities. This report presents the results of a preliminary assessment of urban water reuse in the water contractor's service areas and includes estimates of:

- The potential reduction in peak demands on the water supply system that could be realized through the expanded use of tertiary-treated recycled water for irrigation;
- The potential reduction in annual water supply demands from expanded use of tertiary-treated recycled water; and
- Order of magnitude costs (within -30% to +50% to actual cost) for construction and operation of recycled water distribution systems in urban areas.

Based on the results of this study, it appears that the use of recycled water for irrigation in the water contractors' service areas could (1) offset approximately 4,200 AF of potable water on an annual basis, and (2) decrease the average peak month demand on the Agency's water supply and transmission system by approximately 9 mgd. A summary is presented below of the estimated capital and operations and maintenance (O&M) costs associated with urban water reuse projects.

<u>Water Contractor</u>	<u>Annual Recycled Water Use (AF)</u>	<u>Estimated Capital Cost</u>	<u>Estimated O&amp;M Cost</u>
City of Cotati	30	\$ 400,000	\$100
Forestville Water District	50	600,000	105
North Marin Water District	650	8,800,000	100
City of Petaluma	640	5,800,000	80
City of Rohnert Park	50	800,000	120
City of Santa Rosa	2,170	20,100,000	80
City of Sonoma	135	1,000,000	70
Valley of the Moon Water District	<u>475</u>	<u>4,300,000</u>	<u>80</u>
<b>Total</b>	<b>4,200</b>	<b>\$41,800,000</b>	<b>\$90</b>

Some of the estimated costs presented above would be offset by the reduced amount of additional potable water storage that is currently necessary to meet peak summer demands. A reduction of approximately 9 mgd of average peak month flow would decrease the amount of additional storage that is currently needed by over 30 million gallons. This amount of potable water storage would likely cost on the order of \$30,000,000 to design and construct.

Based on the importance of this recycled water use program to maintain available potable water supplies for the water contractors and other water users, the Agency recommends supporting this program through the Agency's Water Transmission System Operations and Maintenance Fund. Funding would be provided in the amount of \$10,000 per AF of potable water offset. This program would be phased in over a period of 5 years with full funding of \$4,000,000 per year available on the 4<sup>th</sup> through 10<sup>th</sup> year of implementation.

## 1.0 INTRODUCTION

This report presents the results of a preliminary assessment of potential water reuse within the Sonoma County Water Agency's (Agency) service area (Figure 1). The Agency provides a wholesale potable water supply for eight water contractors located in Sonoma and Marin counties and other water customers. Peak demands on the Agency's water supply and transmission system have been increasing at a rate of about 2 million gallons per day (mgd) each year. As a result of these increases, the Agency's water supply system is operating near its capacity during peak water use periods.

The Agency's water contractors consist of the City of Cotati (Cotati), City of Petaluma (Petaluma), City of Rohnert Park (Rohnert Park), City of Santa Rosa (Santa Rosa) and City of Sonoma (Sonoma) and the Forestville Water District (Forestville), North Marin Water District (North Marin), and the Valley of the Moon Water District (VMWD). In June, 1999, the Agency notified the water contractors that the Agency's water supply and transmission system was operating near its capacity and that an additional 24 million gallon (MG) of potable water storage was needed to meet industry standards during current peak water use periods.

The use of recycled water for irrigation in urban areas has the potential to reduce the peak summer demands on the Agency's water supply system and the need to construct additional potable water storage facilities. Pursuant to Section 2.5 of the *Tenth Amended Agreement for Water Supply and Construction of the Russian River-Cotati Intertie Project (Water Supply Agreement)*, the Agency may undertake cost-effective water conservation measures that will reduce demands on the Agency's water transmission system. Based on the *Water Supply Agreement*, the Agency is able to support the development of urban water reuse projects by the water contractors.

The purpose of this preliminary assessment of urban water reuse is to estimate the following:

- The potential reduction in peak demands on the water supply system that could be realized through the expanded use of tertiary-treated recycled water for irrigation;
- The potential reduction in annual water supply demands from expanded use of tertiary-treated recycled water; and
- Order of magnitude costs (within -30% to +50% to actual cost) for construction and operation of recycled water distribution systems in urban areas.

This assessment is intended to provide decision makers with the information necessary to (1) preliminarily evaluate the feasibility of recycled water projects, (2) assess whether the Agency should provide financial support to the water contractors to implement such projects, and (3) identify a level of funding that could be provided for recycled water projects pursuant to the *Water Supply Agreement*.

## **1.1 Scope of Assessment**

This preliminary assessment of urban reuse was performed primarily using existing sources of information provided by the Agency's water contractors. These sources of information included the following:

- Existing water reuse studies
- Potable water use records
- Maps of existing and proposed recycled water distribution systems
- Agency construction-cost data

Urban water reuse studies have been conducted by several of the Agency's water contractors. Based on the review of these reports, the methodologies used to size and estimate construction costs for water reuse projects varied considerably between the water contractors. For the purposes of this report, Agency staff compiled and/or generated the necessary project components for the urban reuse projects and applied consistent cost estimates to each project. The cost estimates presented in this report represent order of magnitude estimates and are intended allow comparisons of the costs and benefits of the various projects.

While these cost estimates can be used for preliminary planning purposes, a second phase feasibility study of potential water reuse would provide a more accurate representation of the necessary components of urban water reuse systems and the associated costs. This additional evaluation should include but not be limited to computer modeling of the pipeline systems, field surveys of potential pipeline routes, assessing environmental concerns, and evaluation of the existing recycled water irrigation systems.

## **1.2 Water Reuse Regulations**

As indicated above, the purpose of this report is to evaluate opportunities for reducing potable water demands through the use of tertiary-treated recycled water for urban irrigation. Allowable uses of tertiary-treated recycled water are specified in the California Code of Regulations (CCR), Title 22. The definition of tertiary-treated recycled water is also presented in these regulations. Specifically, tertiary treatment is defined as a treatment process for wastewater that includes biological treatment, settling or clarification, coagulation, filtration and disinfection.



Allowable uses of recycled water are specified in CCR Title 22, Section 60303. According to CCR Title 22, disinfected tertiary recycled water can be used for irrigation of the following:

- Food crops where the recycled water comes into contact with the edible portion of the crop, which includes all edible root crops
- Parks and playgrounds
- School yards
- Residential landscaping
- Unrestricted access golf courses.
- Recreational impoundments
- Flushing toilets and urinals
- Decorative fountains
- Commercial laundries
- Any other irrigation use not specified in this section and not prohibited by other sections of the California Water Code

Irrigation area requirements for tertiary recycled water are also specified in CCR Title 22 and include the following:

- No irrigation with disinfected tertiary recycled water shall take place within 50 feet of any domestic water supply well.
- No impoundment of disinfected tertiary recycled water shall take place within 100 feet of any domestic water supply well.
- Any use of recycled water shall comply with the following: (1) Any irrigation runoff shall be confined to the recycled water use area unless otherwise authorized by the regulatory agency; (2) Spray, mist, or runoff shall not enter a dwelling or a food handling facility; (3) Drinking water fountains and designated outdoor eating areas shall be protected against contact with recycled water spray, mist, or runoff.
- All areas where recycled water is used and that are accessible to the public shall be posted with conspicuous signs, in a size no less than 4 inches high by 8 inches wide, that include the following wording: "RECYCLED WATER - DO NOT DRINK."
- Except as allowed under Section 7604 of Title 17, no physical connection shall be made or allowed to exist between any recycled water system and any separate system conveying potable water.
- The recycled water system shall not include any hose bibbs. Quick couplers that are different from that used on the potable water system may be used.

### **1.3 Water Supply Agreement**

The Agency provides water to its water contractors in accordance with the terms and conditions presented in the *Water Supply Agreement*. This agreement describes the obligations of the Agency to provide water supply or supplemental water supply to the water contractors and the obligations of the water contractors to pay for the delivered water and for a water conservation program. This agreement also specifies the delivery entitlements of the water contractors. These entitlements are defined as average flow expressed in mgd during a month and are as follows:

<b><u>Contractor</u></b>	<b><u>Average During Month</u></b>
Santa Rosa	50.0 mgd
Petaluma	17.0 mgd
North Marin	11.2 mgd
Valley of the Moon	4.7 mgd
Sonoma	3.3 mgd
Cotati	1.7 mgd
Forestville	1.5 mgd
Rohnert Park	1.0 mgd

### **1.4 Report Organization**

The following chapters present potential water reuse projects in the Agency's service area. A summary of the total estimated recycled water use, estimated construction costs, and estimated operations and maintenance (O&M) costs are presented on Table 1. Tables 2 through 7 present order of magnitude cost estimates for the design and construction of recycled water distribution systems in each water contractor's service area. Figures 2 through 7 present conceptual layouts for recycled water distribution systems.

## **2.0 FORESTVILLE WATER DISTRICT**

### **2.1 Water Use Summary**

Forestville provides potable water to the unincorporated communities of Forestville and Mirabel Heights in western Sonoma County. Forestville is currently entitled to receive an average monthly flow of 1.5 mgd from the Agency's water supply system. In 1998, Forestville received water deliveries totaling 430 acre feet (AF) and had a peak month average flow of 0.7 mgd.

### **2.2 Prospective Water Reuse Sites**

Forestville's water service area contains several parks and schools that currently irrigate with potable water and are candidates for irrigation with recycled water. These sites include El Molino High School, Forestville Elementary School, and the Forestville Youth Park. These sites, which are shown on Figure 2, use approximately 50 AF of water for irrigation. The estimated peak flow for these sites is 0.1 mgd, which occurs during the summer months.

## **2.3 Recycled Water Source**

Municipal wastewater collection, treatment, and reclamation for the unincorporated community of Forestville is provided by the Forestville County Sanitation District (Forestville CSD). The Forestville CSD treatment plant is located in the southern part of Forestville and produces secondary-treated recycled water. A project is currently planned that will upgrade the Forestville CSD treatment plant to tertiary treatment within two years. The Forestville CSD treatment plant also plans to treat wastewater from the unincorporated community of Mirabel Heights and will have an average dry weather flow (ADWF) of approximately 0.1 mgd beginning next year. By storing a portion of the recycled water produced during the winter in existing storage ponds, this treatment plant would have the ability to accommodate both the annual and peak recycled water demands.

## **2.4 Recycled Water Distribution**

The Agency and a consultant for the Forestville CSD have developed a preliminary layout for a recycled water transmission system that would provide recycled water to the sites described above. This system would include a pump and effluent filter station at the Forestville CSD treatment plant, and approximately 1.5 miles of 4- to 6-inch diameter pipe and a 20,000-gallon reservoir. This system would cost an estimated \$600,000 to design and construct (\$12,000 per AF). The annual operation and maintenance (O&M) cost is estimated at \$105 per AF which includes pipeline and pump station maintenance and electricity costs.

## **3.0 NORTH MARIN WATER DISTRICT**

### **3.1 Water Use Summary**

North Marin provides potable water to the City of Novato and surrounding areas in Marin County. North Marin operates a water treatment plant for a source of water located in the Novato area and also receives an 11.2-mgd entitlement from the Agency. In 1998, North Marin received water deliveries from the Agency totaling 6,000 AF for the year with a peak month average flow of 9.9 mgd.

### **3.2 Prospective Water Reuse Sites**

North Marin retained the consulting firm of Nute Engineering in 1991 to conduct an evaluation of potential water reuse that could benefit both North Marin and the Novato Sanitary District (Novato SD). The study included (1) the identification of sites containing irrigation meters, (2) the identification of sites irrigated with water from private wells, (3) a conceptual layout of a recycled water distribution system that could provide water to the identified sites, and (4) cost estimates for construction of the necessary treatment plant improvements and distribution system. The results of this study were presented in a November 1991 report titled *Water Recycling Studies*.

The North Marin service area contains several parks, commercial developments, multifamily residential area and schools that could be irrigated with recycled water to reduce the demand North Marin's system during the peak use periods. These sites were estimated by Nute Engineering to use approximately 650 AF of water for irrigation. The estimated peak month average peak flow for these sites is 1.4 mgd. For the purposes of this current evaluation, urban reuse and construction cost estimates were limited to sites that are irrigated with potable water supplied by North Marin.

### **3.3 Recycled Water Source**

Municipal wastewater collection, treatment, and reclamation in the North Marin service area is provided by the Novato SD. The Novato SD treatment plant is located east of Novato and produces tertiary-treated recycled water and currently provides treatment for an ADWF of about 4.5 mgd.

### **3.4 Recycled Water Distribution**

A layout for a recycled water transmission and distribution system was prepared for North Marin by Nute Engineering. Based on the Agency's review of this system, modifications were made to this layout in order to develop cost estimates for a system that would only provide recycled water to sites currently irrigated with water from North Marin. This conceptual system prepared by Agency staff includes a pump station at the Novato SD treatment plant, approximately 15 miles of 4- to 20-inch diameter pipe, and two storage tanks. This system, which is presented on Figure 3, would cost an estimated \$8,800,000 to design and construct (\$13,500 per AF). The annual O&M cost is estimated at \$100 per AF.

## **4.0 CITY OF PETALUMA**

### **4.1 Water Use Summary**

The City of Petaluma is located in southern Sonoma County and receives a 17.0-mgd entitlement from the Agency. In 1998, Petaluma received water deliveries from the Agency totaling 9,000 AF with a peak month average flow of 13.8 mgd.

### **4.2 Prospective Water Reuse Sites**

Petaluma performed an evaluation and prepared a conceptual layout of an urban reuse system in 1998. The study included (1) the identification of sites containing meters that only monitor water supplied for irrigation, (2) the identification of sites that currently are not irrigated with water from Petaluma but could utilize recycled water for irrigation, (3) a conceptual layout of a recycled water distribution system that could provide water to the identified sites, and (4) cost estimates for construction of the necessary treatment plant improvements and distribution

system. The results of this study was presented in a September 1998 report prepared by the City of Petaluma titled *Draft Wastewater Facilities and Effluent Management Plan, City of Petaluma*.

For the purposes of this current evaluation, urban reuse estimates were limited to sites that currently are irrigated with water supplied by Petaluma. Additionally, the conceptual layout and cost estimates prepared for a recycled water distribution system were limited to serving sites that are currently irrigated with water from Petaluma.

The Petaluma service area contains several parks and schools that could be irrigated with recycled water to reduce the demand on Petaluma's water system during the peak use periods. These sites were estimated to use approximately 640 AF of water for irrigation and are shown on Figure 4. The estimated peak month average flow for these sites is 1.4 mgd.

#### **4.3 Recycled Water Source**

Petaluma provides both water supply and municipal wastewater collection, treatment, and reclamation in Petaluma. Petaluma's wastewater treatment plant is located in southern Petaluma and currently provides wastewater treatment for an ADWF of about 4.6 mgd. This treatment plant currently produces secondary-treated recycled water would need to be upgraded to provide tertiary treatment in order to realize the estimated potable water savings described in this report.

#### **4.4 Recycled Water Distribution**

A layout for a recycled water transmission and distribution was prepared by Petaluma and is shown on Figure 4. Based on the Agency's review of this system, modifications were made to this layout in order to develop cost estimates for a system that would only provide recycled water to sites currently irrigation with potable water supplied by Petaluma. The conceptual system prepared by Agency staff includes a pump station at the Petaluma treatment plant, approximately 8 miles of 4- to 24-inch diameter pipe, and two storage tanks. This system would cost an estimated \$5,800,000 to design and construct (\$9,100 per AF). The annual O&M cost is estimated at \$80 per AF.

### **5.0 CITY OF COTATI AND CITY OF ROHNERT PARK**

#### **5.1 Water Use Summary**

The Agency is currently obligated to deliver an average monthly flow of 1.7 mgd to Cotati and 1.0 mgd to Rohnert Park. In 1998, Cotati received water deliveries from the Agency totaling 620 AF with a peak month average flow of 1.0 mgd; Rohnert Park received 2,900 AF and a peak month average flow of 4.9 mgd in 1998.

## **5.2 Prospective Water Reuse Sites**

Cotati currently irrigates several parks with Agency-supplied water that could be irrigated with recycled water. These sites include Kotati Park, Helen Putnum Park and the Cotati Hub Park. These sites, which are shown on Figure 5, use approximately 30 AF of water for irrigation per year and have an estimated peak flow of 0.1 mgd.

An extensive distribution system was constructed in Rohnert Park for the urban use of recycled water from the City of Santa Rosa's Subregional Treatment System. This distribution system provides recycled water to golf courses, parks, schools, and commercial properties. Extensions of the existing system to serve La Fiesta School/Ladybug Park, Caterpillar Park, Cielo Park, Golis Park/Gold Ridge School, Lacrosse Park, Lydia Court Park, Honeybee Park/Hahn School, and other private and public properties could increase the amount of recycled water used for irrigation by 50 AF per year. These extensions could reduce peak demands to Rohnert Park by about 0.1 mgd. Therefore, the combined reduction in demand from the increased use of recycled water in Cotati and Rohnert Park would be approximately 80 AF per year. The peak month average demand on the Petaluma and Cotati Intertie Aqueducts would decrease by about 0.2 mgd.

## **5.3 Recycled Water Source**

Municipal wastewater collection, treatment, and reclamation for Cotati and Rohnert Park is provided by the City of Santa Rosa's Subregional Treatment System. The Subregional system also provides tertiary wastewater treatment for the City of Santa Rosa, City of Sebastopol, and the South Park County Sanitation District. This treatment plant has a capacity of about 19 mgd. Because of the high demand for tertiary treated recycled water in the Santa Rosa area, nearly all of the recycled water that the Subregional system produces during the summer months is reused. Additional recycled water will need to be available during the irrigation season to meet anticipated future demands for the Subregional system's recycled water.

## **5.4 Recycled Water Distribution**

Santa Rosa staff has provided the Agency with the layout for the recycled water transmission system in Rohnert Park. This system and potential extensions to this system are shown on Figure 5. The extensions would approximately 4 miles of 3- to 8-inch diameter pipe and would cost an estimated \$1,200,000 to design and construct (\$15,000 per AF). Of this total estimated construction cost, \$400,000 is associated with the Cotati portion of the extension (\$13,300 per AF) and \$800,000 is associated with the Rohnert Park portion of the extension (\$16,000 per AF). The annual O&M cost is estimated at \$100 per AF for Cotati and \$120 per AF for Rohnert Park.

## **6.0 CITY OF SANTA ROSA**

### **6.1 Water Use Summary**

The City of Santa Rosa currently receives a 50.0-mgd average monthly flow entitlement from the Agency. In 1998, Santa Rosa received water deliveries totaling 21,500 AF with a peak month average flow of 32.9 mgd.

### **6.2 Prospective Water Reuse Sites**

Santa Rosa and Agency staff has evaluated several urban reuse scenarios and developed a preliminary irrigation system that could provide recycled water to public and private irrigation sites in Santa Rosa. Irrigation sites in western Santa Rosa include Elsie Allen High School, Northpoint Business Park, Stony Point Business Park, Corby Avenue, Countryside East residential development, Fountaingrove Golf Course, Northwest Community Park, Pioneer Park, Santa Rosa Business Park, Hewitt, Jacobs and Westgate Parks. The irrigation sites in western Santa Rosa would use approximately 1,280 AF of water for irrigation per year and have an estimated peak month average flow of 2.7 mgd.

Irrigation sites in eastern Santa Rosa include the Bennett Valley Golf Course, Sonoma County Fairground, Sonoma County Fairgrounds Golf Course, businesses along South Santa Rosa Avenue and in downtown Santa Rosa, Santa Rosa's City Hall, Howarth Park, Julliard Park, Dan Galvin Park, Howarth Park, Herbert Slater Middle School, and Maria Carillo High School. These sites would use approximately 890 AF of water per year and have an estimated peak month average flow of 2.0 mgd.

The recycled water distribution systems for Santa Rosa are shown on Figure 6. These systems would cumulatively provide approximately 2,170 AF of water per year for irrigation and have an estimated peak daily flow of 4.7 mgd.

### **6.3 Recycled Water Source**

As indicated previously, municipal wastewater collection, treatment, and reclamation for Santa Rosa is provided by the City of Santa Rosa Subregional Wastewater Treatment System. Because of the high demand for tertiary treated recycled water in the Santa Rosa area, nearly all of the recycled water that the Subregional treatment system produces is reused during the summer months. Additional recycled water will need to be available during the irrigation season to meet anticipated future demands for the Subregional system's recycled water.

## **6.4 Recycled Water Distribution**

The conceptual recycled water distribution for Santa Rosa as described above is shown on Figure 6. The system would include approximately 45 miles of 2- to 24-inch diameter pipe. The western portion of the system would cost an estimated \$12,500,000 for design and construction (\$9,800 per AF) and the eastern portion of the system would cost an estimated \$7,600,000 for design and construction (\$8,500 per AF). Overall the system would cost an estimated \$20,100,000 to design and construct (\$9,300/AF). The annual O&M cost is estimated at \$80 per AF.

## **7.0 CITY OF SONOMA AND VALLEY OF THE MOON WATER DISTRICT**

### **7.1 Water Use Summary**

Sonoma currently receives a 3.3-mgd average monthly flow entitlement from the Agency's Sonoma aqueduct. This aqueduct also serves the VMWD. In 1998, Sonoma received water deliveries totaling 2,300 AF with a peak month average flow of 3.0 mgd.

The VMWD is entitled to receive an average monthly flow of 4.7 mgd from the Agency's Sonoma aqueduct. In 1998, the Agency delivered approximately 2,800 AF with a peak month average flow of 4.1 mgd to Valley of the Moon.

### **7.2 Prospective Water Reuse Sites**

Sonoma's water service area contains several parks and schools that currently irrigate with potable water and are candidates for irrigation with recycled water. These sites include Sonoma Valley High School, the Plaza, Arnold Field, Sonoma Valley High School and the Sonoma Baseball Fields. These sites, which are shown on Figure 7, use approximately 135 AF of water for irrigation. The estimated peak flow for these sites is 0.3 mgd.

The VMWD service area includes two sites that use significant quantities of potable water for irrigation and include Maxwell Park and the Valley of the Moon Little League field. These sites use approximately 25 AF of water per year. The VMWD has also expressed an interest in utilizing wells owned and operated by the Sonoma National Golf Course for potable water supply. It is estimated that approximately 450 AF of recycled water could be provided to this golf course. The use of recycled water to replace Agency-supplied water and the utilization of the Sonoma National Golf Course wells by VMWD could reduce peak demands by about 1 mgd. Therefore, the combined reduction in demand from the use of recycled water in Sonoma and VMWD would be approximately 610 AF per year. The average peak month demand on the Sonoma Aqueduct would decrease by about 1.3 mgd.



### **7.3 Recycled Water Source**

Municipal wastewater collection, treatment, and reclamation for Sonoma is provided by the Sonoma Valley County Sanitation District (Sonoma Valley CSD). The Sonoma Valley CSD treatment plant is located approximately 2 miles south of Sonoma and currently provides wastewater treatment for an average dry-weather flow of about 2.8 mgd. This treatment plant currently produces secondary-treated recycled water but will be upgraded to provide tertiary treatment.

### **7.4 Recycled Water Distribution**

Agency staff has developed a preliminary layout for a recycled water transmission system that would provide recycled water to the sites described above. This system would include a pump station at the Sonoma Valley CSD treatment plant, approximately 6 miles of 12- to 16-inch diameter pipe, and several thousand feet of 4-inch diameter distribution pipe. This system would cost an estimated \$5,300,000 to design and construct (\$8,700 per AF). Of this total estimated construction cost, \$1,000,000 is associated with the Sonoma portion of the system (\$7,400 per AF) and \$4,300,000 is associated with the VMWD portion of the system (\$9,100 per AF). The annual O&M cost is estimated at \$70 per AF for Sonoma and \$80 per AF for VMWD.

## 8.0 SUMMARY

Based on the results of this study, it appears that the use of recycled water for irrigation in the water contractors' service areas could (1) offset approximately 4,200 AF of potable water on an annual basis, and (2) decrease the average peak month demand on the Agency's water supply and transmission system by approximately 9 mgd. A summary is presented below of the estimated capital and O&M costs associated with urban water reuse projects.

<u>Water Contractor</u>	<u>Annual Recycled Water Use (AF)</u>	<u>Estimated Capital Cost</u>	<u>Estimated O&amp;M Cost</u>
City of Cotati	30	\$ 400,000	\$100
Forestville Water District	50	600,000	105
North Marin Water District	650	8,800,000	100
City of Petahuma	640	5,800,000	80
City of Rohnert Park	50	800,000	120
City of Santa Rosa	2,170	20,100,000	80
City of Sonoma	135	1,000,000	70
Valley of the Moon Water District	<u>475</u>	<u>4,300,000</u>	<u>80</u>
<b>Total</b>	<b>4,200</b>	<b>\$41,800,000</b>	<b>\$90</b>

Some of the estimated costs presented above would be offset by the reduced amount of additional potable water storage that is currently necessary to meet peak summer demands. A reduction of approximately 9 mgd of average peak month flow would decrease the amount of additional storage that is currently needed by over 30 million gallons. This amount of potable water storage would likely cost on the order of \$30,000,000 to design and construct.

## **9.0 CONCLUSIONS AND RECOMMENDATIONS**

As indicated previously, the demand on the Agency's water supply system is near its capacity during peak water use periods in the summer months. As the baseline demand for water increases, the number and duration of periods in which the Agency's water supply system is unable to meet peak demands will increase.

The use of recycled water for irrigation in urban areas has the potential to reduce the peak summer demands on the Agency's water supply system. Based on the results of this preliminary assessment, the use of recycled water appears to be a feasible alternative for reducing demands on the Agency's water supply and transmission system. Additionally, use of recycled water would decrease the need for construction of additional potable water storage reservoirs to meet peak demands.

The full development of the water reuse program described in this report could reduce the water contractors' demand on the Agency system by about 6% annually and 12% during the peak average months. While cost for recycled water is greater than the cost of water produced by the Agency's existing water supply and transmission system, the Agency's existing water supply and transmission system and water right limitations may limit the amount of such water that will be available in the near future. It is not known at this time when the Agency will be able to secure an additional supply of potable water, therefore, the increased use of recycled water will be necessary to allow the Agency to meet the future needs of its water contractors.

The recycled water use program described in this report would reduce potable water demands by about 4,200 AF and would cost on the order of \$41,800,000 (\$10,000 per AF) to construct. Based on the importance of this recycled water use program to maintain available potable water supplies for the water contractors and other water users, the Agency recommends supporting this program through the Agency's Water Transmission System Operations and Maintenance Fund. Funding would be provided in the amount of \$10,000 per AF of potable water offset. This program would be phased in over a period of 5 years with full funding of \$4,000,000 per year available on the 4<sup>th</sup> through 15<sup>th</sup> year of implementation.

**TABLES**

**TABLE 1**  
**SUMMARY OF ESTIMATED RECYCLED WATER USE AND COSTS**  
**SONOMA COUNTY WATER AGENCY SERVICE AREA**

Location	Reduction in Potable Water Demand	Estimated Construction Cost	Estimated Capital Cost per Acre Foot	Estimated O & M Cost per Acre Foot
City of Cotati	30	\$400,000	\$13,300	\$100
Forestville County Water District	50	\$600,000	\$12,000	\$105
North Marin Water District	650	\$8,800,000	\$13,500	\$100
City of Petaluma	640	\$5,800,000	\$9,100	\$80
City of Rohnert Park	50	\$800,000	\$16,000	\$120
City of Santa Rosa - Western System	1280	\$12,500,000	\$9,800	\$90
City of Santa Rosa - Eastern System	890	\$7,600,000	\$8,500	\$80
City of Sonoma	135	\$1,000,000	\$7,400	\$70
Valley of the Moon Water District	475	\$4,300,000	\$9,100	\$80
<b>Total</b>	<b>4,200</b>	<b>41,800,000</b>	<b>\$10,000</b>	<b>\$90</b>

**TABLE 2**  
**ESTIMATED COSTS**  
**URBAN WATER REUSE**  
**FORESTVILLE WATER DISTRICT**

<b>Item Number</b>	<b>Description</b>	<b>Quant.</b>	<b>Unit</b>	<b>Unit Cost</b>	<b>Total</b>
1	Mobilization, Demobilization, Startup, Field Test	1	L.S.	\$10,000	\$10,000
	<b>Treatment Plant Modifications</b>				
2	Booster Pumps	2	EACH	\$15,000	\$30,000
3	Electrical Work	1	L.S.	\$10,000	\$10,000
	Subtotal - Treatment Plant Modifications				\$40,000
	<b>Pipeline Construction</b>				
4	6" dia. D.I. Pipe & Appurtenances	5,800	L.F.	\$30	\$174,000
5	4" dia. D.I. Pipe & Appurtenances	2,100	L.F.	\$20	\$42,000
6	Direct Burial Signal Cable	7,900	L.F.	\$4.00	\$31,600
	Subtotal - Pipeline Construction				\$247,600
	<b>Reservoir and Booster Station</b>				
7	El Molino Reservoir and Booster Station	1	L.S.	\$100,000	\$100,000
	Subtotal - Construction Costs				\$397,600
	Engineering Design & Construction Inspection	30%		\$397,600	\$119,280
	Contingency	20%		\$516,880	\$103,376
<b>TOTAL ESTIMATED CONSTRUCTION COSTS</b>					<b>\$620,256</b>
<b>TOTAL ESTIMATED CONSTRUCTION COSTS, ROUNDED</b>					<b>\$600,000</b>

**TABLE 3**  
**ESTIMATED COSTS**  
**URBAN WATER REUSE**  
**NORTH MARIN WATER DISTRICT**

Item Number	Description	Quant.	Unit	Unit Cost	Total
1	Mobilization, Demobilization, Startup, Field Test	1	L.S.	\$270,000	\$270,000
<b>Treatment Plant Modifications and Storage Reservoirs</b>					
2	Effluent Pumps	2	EACH	\$60,000	\$120,000
3	Storage Reservoirs	2	EACH	\$300,000	\$600,000
4	Electrical Work	1	L.S.	\$150,000	\$150,000
	Subtotal - Treatment Plant Modifications				\$870,000
<b>Pipeline Construction</b>					
5	20" dia. D.I. Pipe & Appurtenances	4,600	L.F.	\$100	\$460,000
6	16" dia. D.I. Pipe & Appurtenances	9,400	L.S.	\$80	\$752,000
7	12" dia. D.I. Pipe & Appurtenances	14,900	L.F.	\$60	\$894,000
8	10" dia. D.I. Pipe & Appurtenances	16,700	L.F.	\$50	\$835,000
9	8" dia. D.I. Pipe & Appurtenances	23,200	L.F.	\$40	\$928,000
10	6" dia. D.I. Pipe & Appurtenances	7,100	L.F.	\$30	\$213,000
11	4" dia. D.I. Pipe & Appurtenances	5,000	L.F.	\$20	\$100,000
12	Direct Burial Signal Cable	80,900	L.F.	\$4.00	\$323,600
	Subtotal - Pipeline Construction				\$4,505,600
	Subtotal - Construction Costs				\$5,645,600
	Engineering Design & Construction Inspection	30%		\$5,645,600	\$1,693,680
	Contingency	20%		\$7,339,280	\$1,467,856
<b>TOTAL ESTIMATED CONSTRUCTION COSTS</b>					\$8,807,136
<b>TOTAL ESTIMATED CONSTRUCTION COSTS, ROUNDED</b>					<b>\$8,800,000</b>

**TABLE 4**  
**ESTIMATED COSTS**  
**URBAN WATER REUSE**  
**CITY OF PETALUMA**

<b>Item Number</b>	<b>Description</b>	<b>Quant.</b>	<b>Unit</b>	<b>Unit Cost</b>	<b>Total</b>
1	Mobilization, Demobilization, Startup, Field Test	1	L.S.	\$180,000	\$180,000
2	<b>Storage Reservoirs</b>				
	Storage Reservoirs	1	EACH	\$400,000	\$400,000
	<b>Pipeline Construction</b>				
3	24" dia. D.I. Pipe & Appurtenances	6,700	L.F.	\$120	\$804,000
4	20" dia. D.I. Pipe & Appurtenances	2,000	L.F.	\$100	\$200,000
5	18" dia. D.I. Pipe & Appurtenances	8,300	L.S.	\$90	\$747,000
6	16" dia. D.I. Pipe & Appurtenances	1,200	L.F.	\$80	\$96,000
7	12" dia. D.I. Pipe & Appurtenances	1,300	L.F.	\$60	\$78,000
8	10" dia. D.I. Pipe & Appurtenances	14,200	L.F.	\$50	\$710,000
9	8" dia. D.I. Pipe & Appurtenances	1,700	L.F.	\$40	\$68,000
10	6" dia. D.I. Pipe & Appurtenances	5,300	L.F.	\$30	\$159,000
11	4" dia. D.I. Pipe & Appurtenances	3,000	L.F.	\$24	\$72,000
12	Direct Burial Signal Cable	43,700	L.F.	\$4.00	\$174,800
	Subtotal - Pipeline Construction				\$3,108,800
	Subtotal - Construction Costs				\$3,688,800
	Engineering Design & Construction Inspection	30%		\$3,688,800	\$1,106,640
	Contingency	20%		\$4,795,440	\$959,088
<b>TOTAL ESTIMATED CONSTRUCTION COSTS</b>					<b>\$5,754,528</b>
<b>TOTAL ESTIMATED CONSTRUCTION COSTS, ROUNDED</b>					<b>\$5,800,000</b>



**TABLE 5**  
**ESTIMATED COSTS**  
**URBAN WATER REUSE**  
**CITY OF ROHNERT PARK AND CITY OF COTATI**

<b>Item</b>	<b>Description</b>	<b>Quant.</b>	<b>Unit</b>	<b>Unit Cost</b>	<b>Total</b>
<b>1</b>	<b>Mobilization, Demobilization, Startup, Field Test</b>	<b>1</b>	<b>L.S.</b>	<b>\$40,000</b>	<b>\$40,000</b>
	City of Rohnert Park Share			\$30,000	
	City of Cotati Share			\$10,000	
	<b>Pipeline Construction</b>				
<b>2</b>	<b>8" dia. D.I. Pipe &amp; Appurtenances</b>	<b>6,100</b>	<b>L.F.</b>	<b>\$40</b>	<b>\$244,000</b>
	City of Rohnert Park Share			\$122,000	
	City of Cotati Share			\$122,000	
<b>3</b>	<b>6" dia. D.I. Pipe &amp; Appurtenances</b>				
	City of Rohnert Park Share	2,400	L.F.	\$30	\$72,000
	City of Cotati Share	2,400	L.F.	\$30	\$72,000
<b>4</b>	<b>4" dia. D.I. Pipe &amp; Appurtenances</b>				
	City of Rohnert Park	3,000	L.F.	\$20	\$60,000
<b>5</b>	<b>3" dia. D.I. Pipe &amp; Appurtenances</b>				
	City of Rohnert Park Share	4,800	L.F.	\$18	\$86,400
	City of Cotati Share	4,400	L.F.	\$18	\$79,200
<b>6</b>	<b>Direct Burial Signal Cable</b>				
	City of Rohnert Park Share	18,050	L.F.	\$4.00	\$72,200
	City of Cotati Share	9,850	L.F.	\$4.00	\$39,400
	<b>Subtotal - Pipeline Construction</b>				<b>\$725,200</b>
	<b>Subtotal - Construction Costs</b>				<b>\$765,200</b>
	City of Rohnert Park Share			\$442,600	
	City of Cotati Share			\$322,600	
	<b>Engineering Design &amp; Construction Inspection</b>	<b>30%</b>		<b>\$765,200</b>	<b>\$229,560</b>
	City of Rohnert Park Share			\$172,170	
	City of Cotati Share			\$57,390	
	<b>Contingency</b>	<b>20%</b>		<b>\$994,760</b>	<b>\$198,952</b>
	City of Rohnert Park Share			\$149,214	
	City of Cotati Share			\$49,738	
<b>TOTAL ESTIMATED CONSTRUCTION COSTS</b>					<b>\$1,193,712</b>
<b>TOTAL ESTIMATED CONSTRUCTION COSTS, ROUNDED</b>					<b>\$1,200,000</b>
	City of Rohnert Park Share			\$800,000	
	City of Cotati Share			\$400,000	

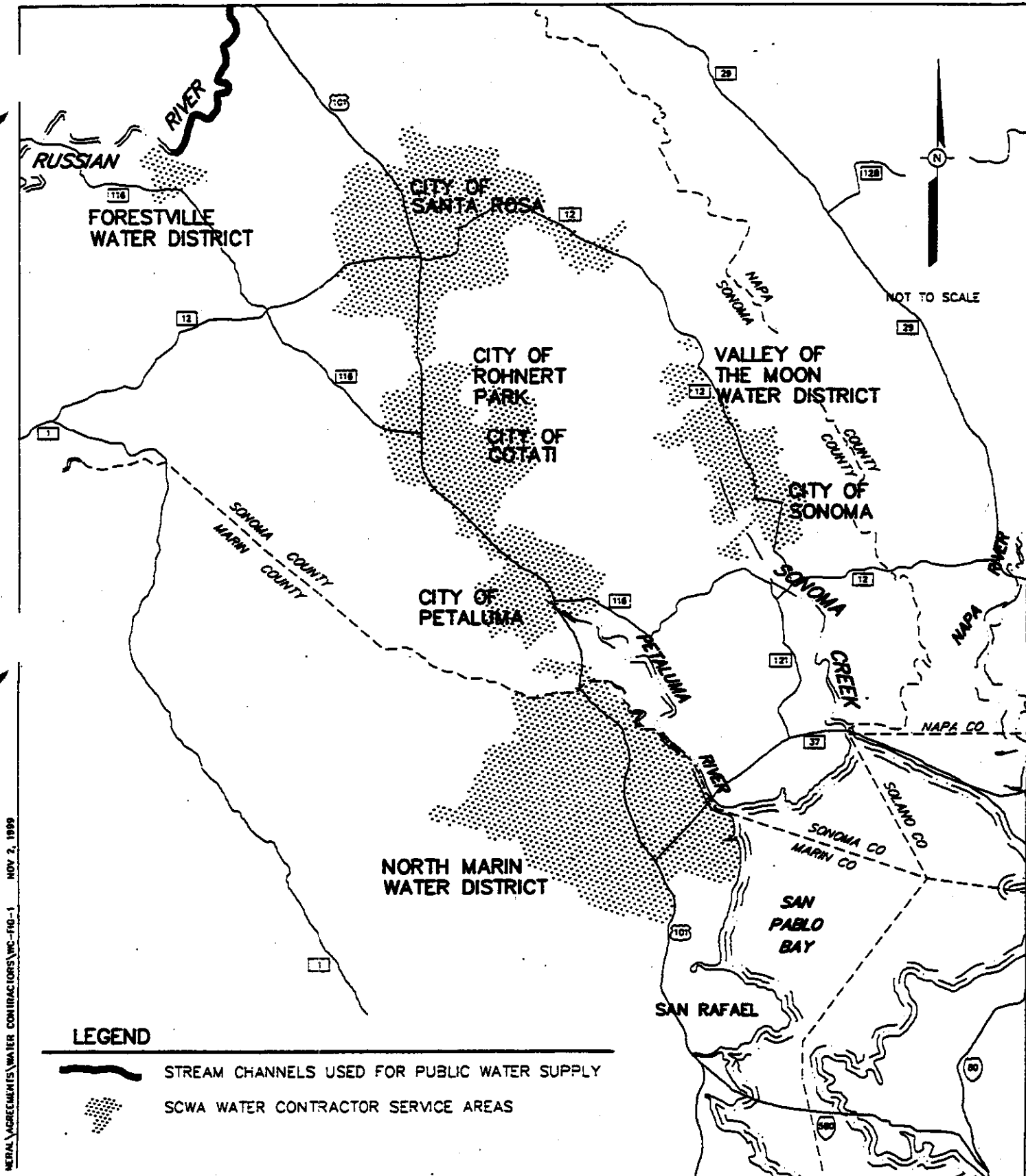
**TABLE 6**  
**ESTIMATED COSTS**  
**URBAN WATER REUSE**  
**CITY OF SANTA ROSA**

Item Number	Description	Quant.	Unit	Unit Cost	Total
<b>Western Santa Rosa Recycled Water Distribution System</b>					
1	Mobilization, Demobilization, Startup, Field Test	1	L.S.	\$400,000	\$400,000
2	24" dia. D.I. Pipe & Appurtenances	5,300	L.F.	\$120	\$636,000
3	20" dia. D.I. Pipe & Appurtenances	4,800	L.F.	\$100	\$480,000
4	16" dia. D.I. Pipe & Appurtenances	4,600	L.F.	\$80	\$368,000
5	14" dia. D.I. Pipe & Appurtenances	8,200	L.F.	\$70	\$574,000
6	12" dia. D.I. Pipe & Appurtenances	14,700	L.F.	\$60	\$882,000
7	10" dia. D.I. Pipe & Appurtenances	5,800	L.F.	\$50	\$290,000
8	8" dia. D.I. Pipe & Appurtenances	28,200	L.F.	\$40	\$1,128,000
9	6" dia. D.I. Pipe & Appurtenances	58,200	L.F.	\$30	\$1,746,000
10	4" dia. D.I. Pipe & Appurtenances	28,400	L.F.	\$20	\$568,000
11	3" dia. D.I. Pipe & Appurtenances	5,800	L.F.	\$18	\$104,400
11	2" dia. D.I. Pipe & Appurtenances	4,900	L.F.	\$14	\$68,600
12	Direct Burial Signal Cable	#####	L.F.	\$4.00	\$675,600
13	Pump Station	1		\$500,000	\$500,000
	Subtotal				\$8,020,000
	Engineering Design & Construction Inspection	30%		\$8,020,000	\$2,410,000
	Contingency	20%		\$10,430,000	\$2,090,000
	Total - Northern Santa Rosa Recycled Water Distribution System				\$12,500,000
<b>Eastern Santa Rosa Recycled Water Distribution System</b>					
1	Mobilization, Demobilization, Startup, Field Test	1	L.S.	\$210,000	\$210,000
2	18" dia. D.I. Pipe & Appurtenances	8,700	L.F.	\$90	\$783,000
3	14" dia. D.I. Pipe & Appurtenances	9,900	L.F.	\$70	\$693,000
4	10" dia. D.I. Pipe & Appurtenances	31,300	L.F.	\$50	\$1,565,000
5	8" dia. D.I. Pipe & Appurtenances	16,300	L.F.	\$40	\$652,000
6	6" dia. D.I. Pipe & Appurtenances	3,700	L.F.	\$30	\$111,000
7	4" dia. D.I. Pipe & Appurtenances	4,800	L.F.	\$20	\$96,000
8	3" dia. D.I. Pipe & Appurtenances	2,300	L.F.	\$18	\$41,400
9	2" dia. D.I. Pipe & Appurtenances	2,000	L.F.	\$14	\$28,000
10	Direct Burial Signal Cable	79,000	L.F.	\$4.00	\$316,000
11	Pump Station	1		\$600,000	\$600,000
	Subtotal				\$4,890,000
	Engineering Design & Construction Inspection	30%		\$4,890,000	\$1,470,000
	Contingency	20%		\$6,360,000	\$1,270,000
	Total - Eastern Santa Rosa Recycled Water Distribution System				\$7,600,000
<b>Summary</b>					
	Total - Northern Santa Rosa Recycled Water Distribution System				\$12,500,000
	Total - Eastern Santa Rosa Recycled Water Distribution System				\$7,600,000
	Total - Santa Rosa Recycled Water Distribution System				\$20,100,000

**TABLE 7**  
**ESTIMATED COSTS, URBAN REUSE WATER**  
**CITY OF SONOMA AND VALLEY OF THE MOON WATER DISTRICT**

Item Number	Description	Quant.	Unit	Unit Cost	Total
1	<b>Mobilization, Demobilization, Startup, Field Test</b>	1	L.S.	\$160,000	\$160,000
	City of Sonoma Share (135 AF of 410 AF)			\$35,000	
	Valley of the Moon Water District Share (275 AF of 410 AF)			\$125,000	
	<b>Treatment Plant Modifications</b>				
2	Booster Pumps	2	EACH	\$30,000	\$60,000
3	Electrical Work	1	L.S.	\$20,000	\$20,000
	<b>Subtotal - Treatment Plant Modifications</b>				\$80,000
	City of Sonoma Share			\$18,000	
	Valley of the Moon Water District Share			\$62,000	
	<b>Shared Pipeline Construction</b>				
4	16" dia. D.I. Pipe & Appurtenances	20,500	L.F.	\$80	\$1,640,000
	City of Sonoma Share			\$363,000	
	Valley of the Moon Water District Share			\$1,277,000	
1	Direct Burial Signal Cable	20,500	L.F.	\$4.00	\$82,000
	City of Sonoma Share			\$18,000	
	Valley of the Moon Water District Share			\$64,000	
	<b>Sonoma Pipeline Construction</b>				
6	4" dia. D.I. Pipe & Appurtenances	5,300	L.F.	\$20	\$106,000
1	Direct Burial Signal Cable	5,300	L.F.	\$4.00	\$21,200
	<b>Valley of the Moon Water District Pipeline Construction</b>				
5	12" dia. D.I. Pipe & Appurtenances	20,000	L.F.	\$60	\$1,200,000
7	Direct Burial Signal Cable	20,000	L.F.	\$4.00	\$80,000
	<b>Subtotal - Pipeline Construction</b>				\$3,129,200
	City of Sonoma Share			\$508,200	
	Valley of the Moon Water District Share			\$2,621,000	
	<b>Subtotal - Construction Costs</b>				\$3,369,200
	City of Sonoma Share			\$561,200	
	Valley of the Moon Water District Share			\$2,808,000	
	Engineering Design & Construction Inspection	30%		\$3,369,200	\$1,010,760
	City of Sonoma Share			\$224,000	
	Valley of the Moon Water District Share			\$786,760	
	Contingency	20%		\$4,379,960	\$875,992
	City of Sonoma Share			\$194,000	
	Valley of the Moon Water District Share			\$681,992	
<b>TOTAL ESTIMATED CONSTRUCTION COSTS</b>					\$5,255,952
<b>TOTAL ESTIMATED CONSTRUCTION COSTS, ROUNDED</b>					\$5,300,000
	City of Sonoma Share			\$1,000,000	
	Valley of the Moon Water District Share			\$4,300,000	

## ILLUSTRATIONS



NEPA/AGREEMENTS/WATER CONTRACTORS/WC-FIG-1 NOV 2, 1999

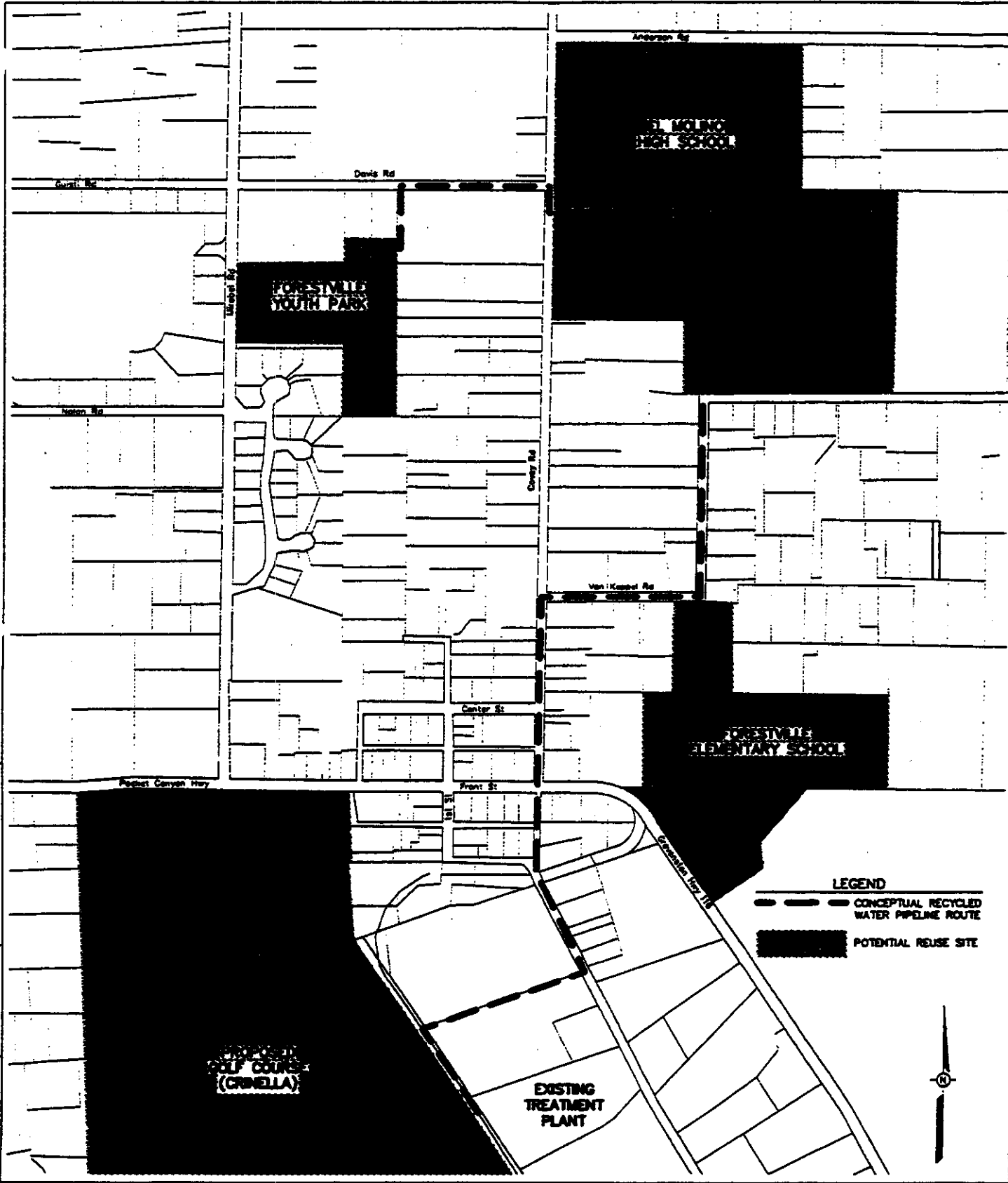


# SONOMA COUNTY WATER AGENCY SERVICE AREA

FIGURE  
1

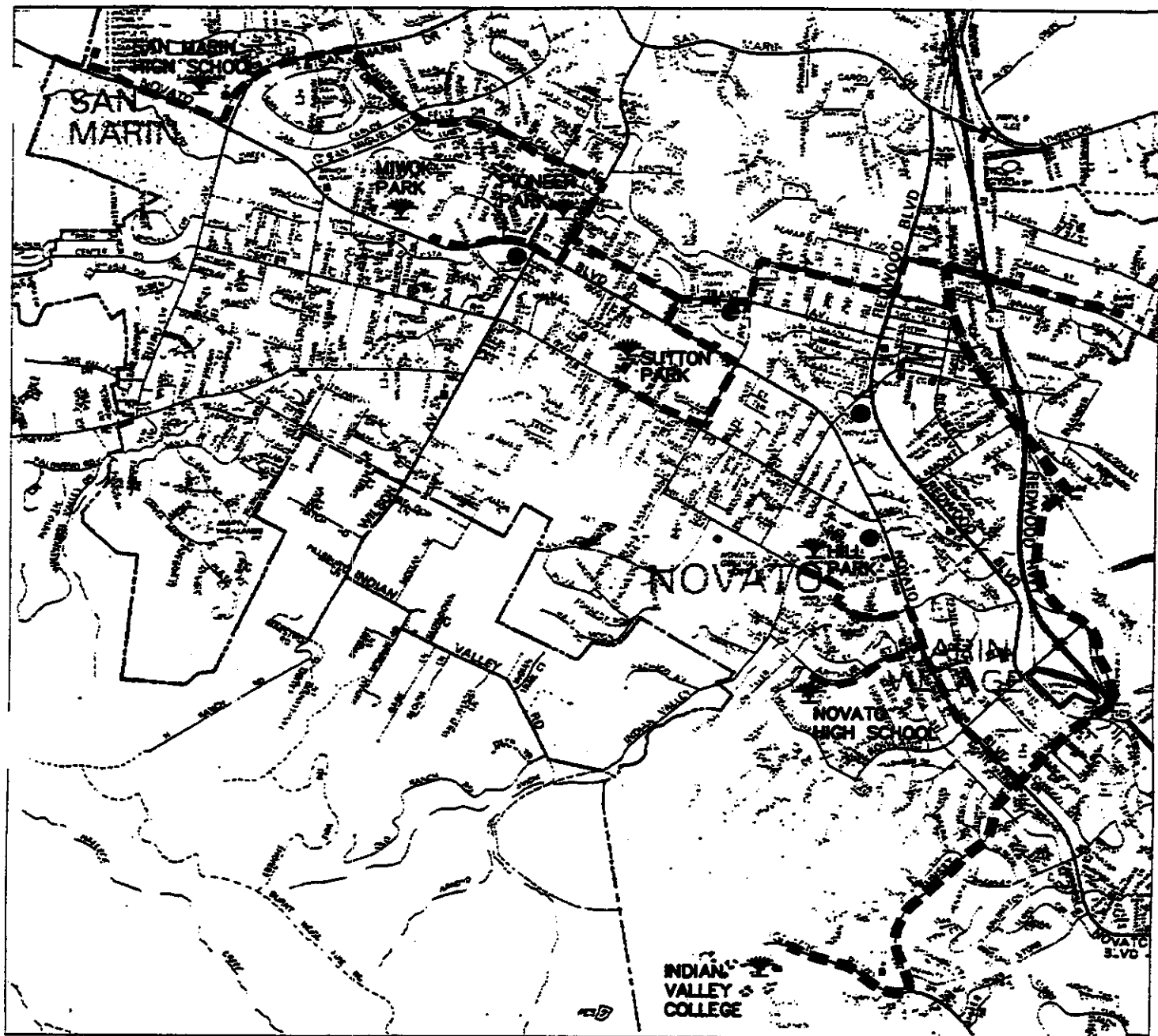
SEPT. 21, 1999

WATER TRANSFER AGREEMENTS/WATER CONTRACTORS/WC-F02



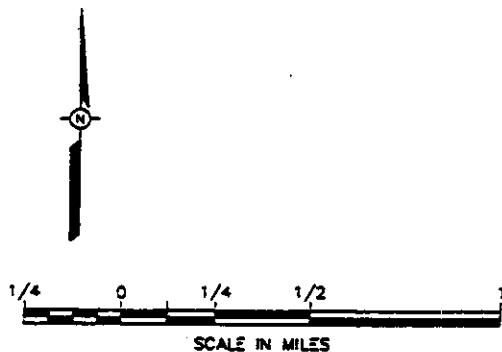
CONCEPTUAL LAYOUT  
RECYCLED WATER DISTRIBUTION SYSTEM  
FORESTVILLE WATER DISTRICT

FIGURE  
2



LEGEND:

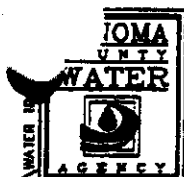
- CONCEPTUAL RECYCLED WATER PIPELINE ROUTE
- 🌳 POTENTIAL IRRIGATION SITE \*

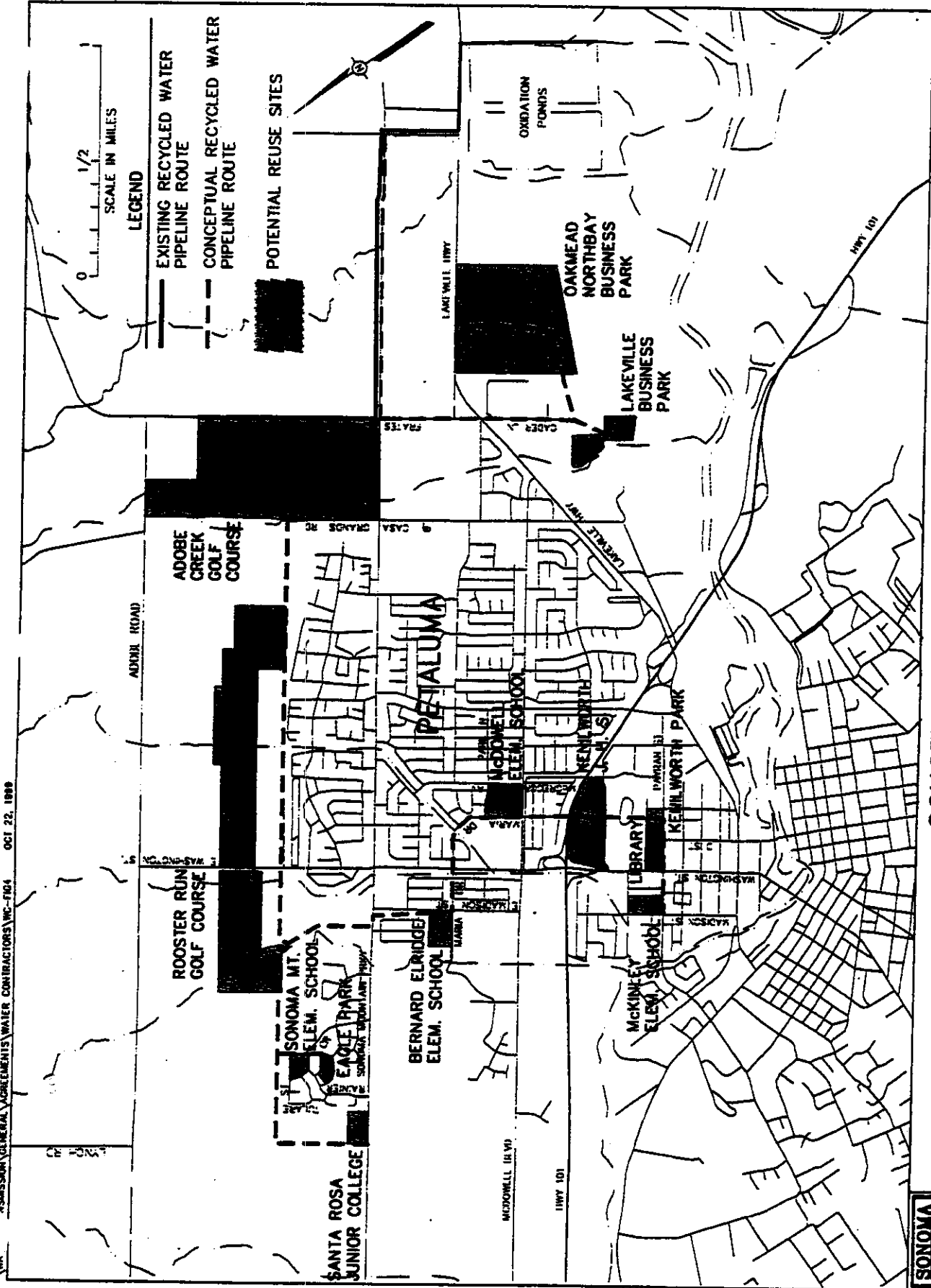


\* NOT ALL IDENTIFIED IRRIGATION SITES ARE SHOWN

CONCEPTUAL LAYOUT  
RECYCLED WATER DISTRIBUTION SYSTEM  
NORTH MARIN WATER DISTRICT.

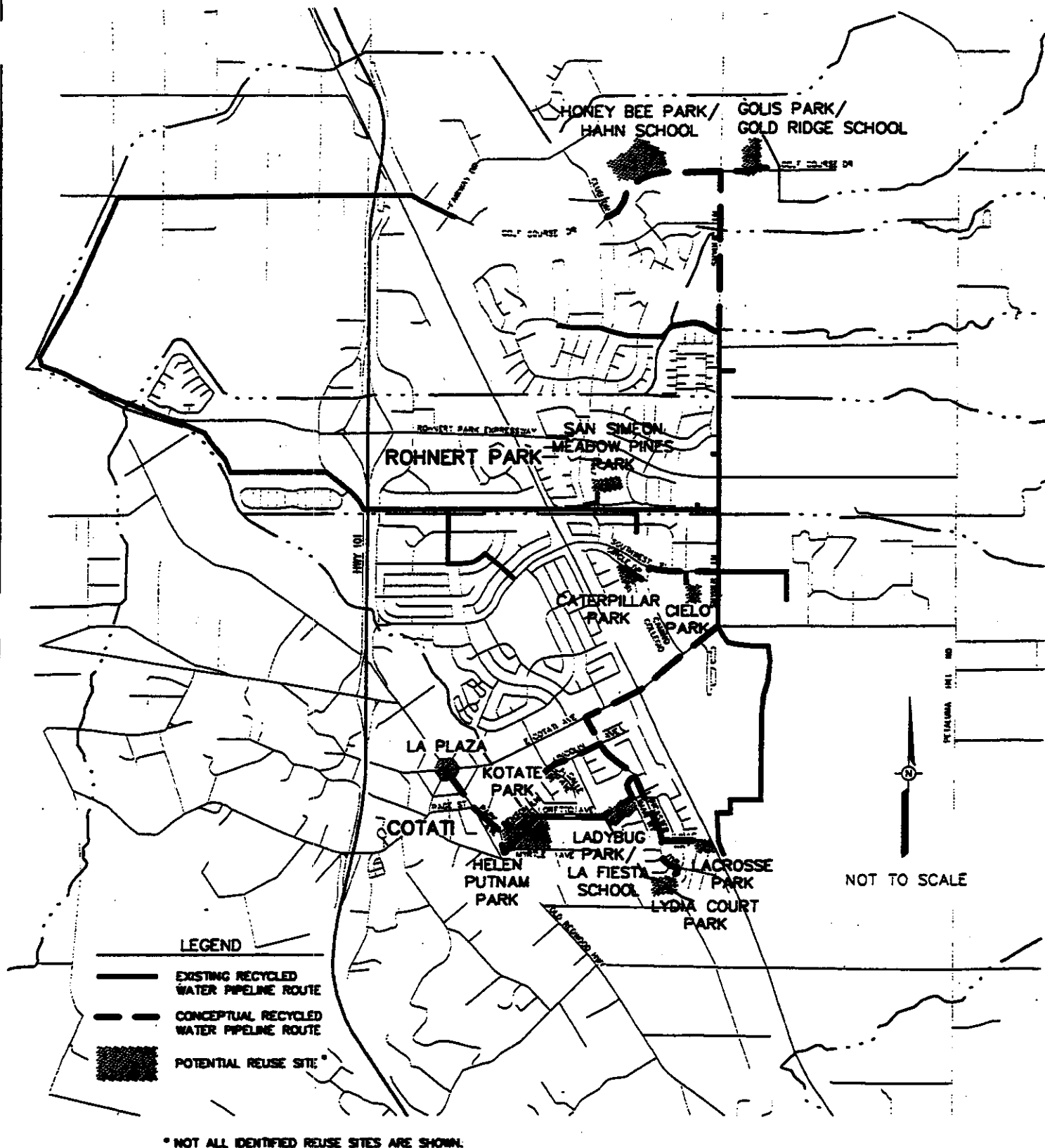
FIGURE  
3





CONCEPTUAL LAYOUT  
RECYCLED WATER DISTRIBUTION SYSTEM  
CITY OF PETALUMA



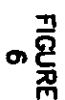


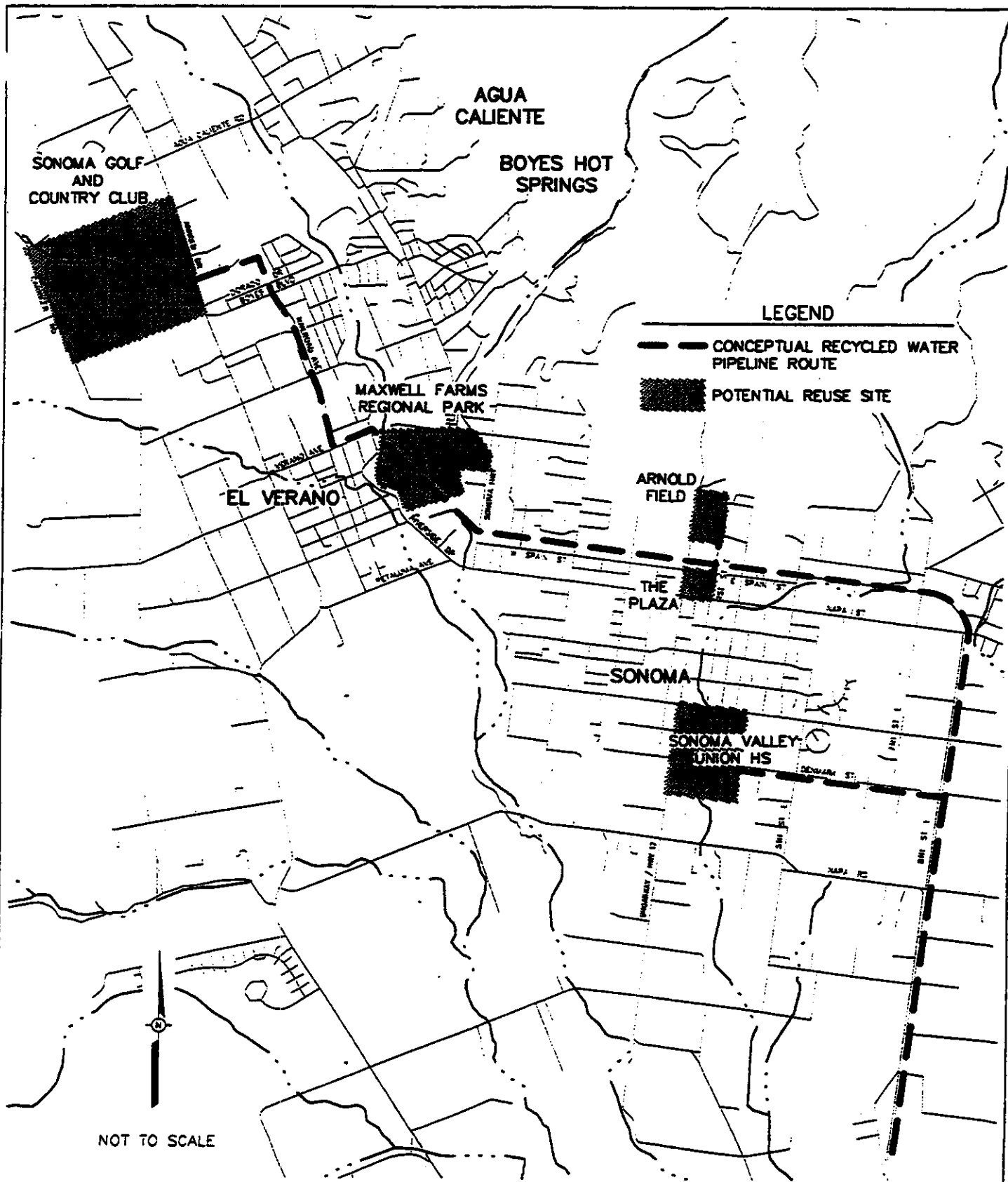
\* NOT ALL IDENTIFIED REUSE SITES ARE SHOWN.



CONCEPTUAL LAYOUT  
EXPANDED RECYCLED WATER DISTRIBUTION SYSTEM  
CITY OF ROHNERT PARK AND CITY OF COTATI

FIGURE  
5





**CONCEPTUAL LAYOUT  
RECYCLED WATER DISTRIBUTION SYSTEM  
CITY OF SONOMA AND VALLEY OF THE MOON WATER DISTRICT**

## **Appendix F**

### **Best Management Practices Activity Profile**

## Activity Profile of Water Conservation Measures Undertaken by Water Contractors

(This table shows measures undertaken through June 2000. Asterisk indicates a funded and designed program to be fully implemented by the end of calendar yr 2000.)

[illegible]

Continued												
No.	Water Conservation Measure	Notes	Cotati	FWD	Pet.	RP	SR	Son.	NMWD	VOM	M MWD	Wind.
9	CII Programs											
	CULFT Replacement on Resale of property											
	CULFT Rebates		X		X	X			X		*	
	CULFT Direct Installation Program				X						schools	
	CII Survey and Incentive Program(s)				*						X	
	Sanitation Fixture Surveys	b										
	Coin Operated Rate/incentives available	k										
10	Wholesale Agency (SCWA) Assistance	k	X	X	X	X	X	X	X	X	N/A	X
11	Conservation Pricing											
	Uniform Commodity rate	l	X	X	X				X	X		
	Tiered (escalating) Conservation rate	m						X			X	X
12	Conservation Co-ordinator	n	O	C	C	C	O	O/C	C	O/C	O	O
13	Water Waste Prohibition	o	X	X	X	X	X	X	X	X	X	X
14	Residential ULFT Replacement Program											
	Replacement at Time of Sale of Property								X		*	
	Rebates		X		X	X	X	X	X	X	X	
	Give-a-way Events	p			X	X	X	X	X	X	X	
	ULFT Direct-Install					X						
Other Activities/Measures Above and Beyond BMPs:												
15	Large Meter Testing Prog. (at least 1 test/yr)			X	X		X		X		X	
16	Preemptive PB service line replacement	q	X				X	X	X	X	X	X
17	Xeriscape Demo Garden(s)				X		X		X		X	
18	Incentives for Irrigation Efficiency or Equipment				*		X		residential	*	X	
19	Xeriscape Plant Promotions								X			
20	Standing Displays	r					X		X		X	
21	Committed Booth Outreach	s					X					
22	Workshops for Homeowners				*		X				X	
23	Water Watch Patrol	t					X		*			
24	Incentive for Limiting Turf								X			
25	Prohibit Narrow Strips of Turf (new development)	u			*		X		X		X	
26	Grants for Youth Conservation Programs							X		X		
27	Post Program Survey and Analysis Reports	v			X	X	X	*	X		X	
28	HAWs required in new connections								X			
Water Recycling:												
	Actual deliveries (acre-ft) - yr 2000		0	0	0	138	200	0	0	0	601	
	Planned deliveries (acre-ft) - yr 2010		112	50	460	153	600	**	250	**	1375	

<b>Definitions for Table:</b>									
C	= water contractor contracts with the SCWA for water conservation co-ordinator service.								
CII	= Commercial, institutional and industrial								
CULFT	= commercial ultra low flush toilet (1.6 gpf)								
HAW	= Horizontal axis (high efficiency) clothes washers								
Irr	Meters = meters which provide water used primarily for irrigation purposes.								
MF	= multi-family accounts								
O	= water contractor has own conservation co-ordinator.								
O/C	= collaborative effort of local utility staff and contract SCWA staff.								
PB	= Polybutylene service lines								
SF	= Single family detached home accounts								
*	Program funded, designed and in process of being implemented by the end of calendar yr 2000.								
**	feasibility study planned or underway								
<b>Notes for Table:</b>									
a	Does not include Other Agency customers which accounted for 1.4% or Surplus (agriculture) customers which accounted for 0.7 %.								
b	Survey done by customer or plumbing contractor in order to qualify for ULFT/CULFT rebates.								
c	At various times in the past 25 years, all Water Contractors have distributed water saving kits. An "x" here verifies that the contractor has an active current distribution program.								
d	If UW is > 10%, a system wide audit is required. Some contractors have performed these even if not required by BMP 2.								
e	PG&E offers a \$75 rebate for high efficiency washing machines.								
f	SCWA supplements PG&E's rebate with an additional \$75. Application forms are available at point of sale in area stores/outlets and are processed by a single payout office.								
g	Available from American Water Works Association and other sources. SCWA purchases popular items in bulk to obtain quantity discounts for water contractors.								
h	Also provided by SCWA.								
i	Generally coordinated or undertaken by SCWA.								
j	Provided and coordinated by SCWA. Materials matriculated for grades K - 6 including a Field Studies Program. Currently working on program for Grades 7 through High School. Lending library has been compiled for all grades and teaches provided notice and access.								
k	Coin operated washing machines in laundries, multifamily wash rooms and elsewhere								
l	Prior to the 1980's many Contractors had declining rate structures which were based on the assumption that water supply was not limited and reflected the economy of scale of delivering larger amounts of water.								
m	Tiered rates are generally implemented specifically to encourage efficient use of water.								
n	Code denotes who is primarily responsible for water conservation coordinator duties. See definitions.								
o	A Model Water Waste Ordinance was developed by the WAC in spring of 2000.								
p	Example: High School fund raisers with truckload distribution of ULFTs.								
q	PB service lines prematurely fail and leak. A number of utilities have implemented preemptive replacement strategies. If service lines are predominantly of a different material, this issue does not apply.								
r	Permanently installed and maintained displays in local nurseries, garden centers, hardware stores, etc.								
s	Manned booth outreach that is frequent and committed (such as booth at each local farmer's market event or in an outlet mall, etc.								
t	High profile, intentional and committed Water Watch Patrol (not just an incidental function of employees in the field). Example: Santa Rosa's Oops Program.								
u	Applies to new connections only.								
v	Has performed a post conservation measure follow-up survey and analysis of participants in at least one conservation program.								
w	NMWD has piloted a program involving 200 full SF audits.								

## **Appendix F**

### **Best Management Practices California Urban Water Conservation Council**



## **California Urban Water Conservation Council Best Management Practices**

- |               |   |
|---------------|---|
| <b>BMP 1</b>  | <b>Water survey programs for single-family residential and multi-family residential customers</b> |
| <b>BMP 2</b>  | <b>Residential plumbing retrofit</b>  |
| <b>BMP 3</b>  | <b>System water audits, leak detection and repair</b>   |
| <b>BMP 4</b>  | <b>Metering with commodity rates for all new connections and retrofit of existing connections</b> |
| <b>BMP 5</b>  | <b>Large landscape conservation programs and incentives</b>                                       |
| <b>BMP 6</b>  | <b>High-efficiency washing machine rebate programs</b>  |
| <b>BMP 7</b>  | <b>Public information programs</b>  |
| <b>BMP 8</b>  | <b>School education programs</b>  |
| <b>BMP 9</b>  | <b>Conservation programs for commercial, industrial, and institutional accounts</b>               |
| <b>BMP 10</b> | <b>Wholesale agency assistance programs</b>   |
| <b>BMP 11</b> | <b>Conservation pricing</b>   |
| <b>BMP 12</b> | <b>Conservation coordinator</b>   |
| <b>BMP 13</b> | <b>Water waste prohibition</b>  |
| <b>BMP 14</b> | <b>Residential ULFT replacement programs</b>  |

## **Appendix F**

### **Best Management Practices**

- Sonoma County Water Agency
  - Santa Rosa
  - Petaluma
- North Marin Water District
  - Sonoma
- Valley of the Moon Water District
  - Cotati
- Forestville Water District
  - Rohnert Park

# Best Management Practices

## SONOMA COUNTY WATER AGENCY

---

### **BMP 07 – Public Information Programs**

**Implementation:** Annually, the Agency participates in the California Water Awareness Month campaign sponsored by the Association of California Water Agencies. Advertisement space is purchased in the local media and literature and posters on water conservation are distributed to the local and school libraries.

Other programs and events have become standard outreach to the community on behalf of the Agency to promote water conservation and water reuse, such as the following:

#### **Beat the Heat Program**

- Water Impairment tri-folds bill stuffers - 85,000 delivered to water contractors
- Press releases in November and December 1999 and continued press releases during warm weather when it is anticipated demand exceeds production

#### **Media Marketing**

- Highway 101 Permanent Billboard
- Hot Summer Days – Water At Night, 5 months July 1999 to December 1999
- More Work – More Play, 5 months April 2000 to August 2000
- Don't Be A Gutter Flooder – It's Like Throwing Money Down The Drain – August 2000
- Trailer Mounted Portable Billboard – available for any promotion
- Television Advertisements
  - KFTY Channel 50, started August 14th, 2 – 30 second commercials, running for 7 weeks in the morning, during the evening news, during sitcoms in the evening and during the 10 pm news.
  - 1st message addresses outside water waste, 2<sup>nd</sup> addresses indoor usage.
- Radio Advertisements
- KZST FM 100 – May through mid-September
- MIXX FM 104.1 – July and August
- Movie Theater Ads – Beginning Labor Day 840 ads a week for seven weeks in Petaluma and Novato
- Newspaper and Printed Advertisements
- Press Democrat summer campaign (5 Sundays and 5 Wednesdays) and as a special insert in the Press Democrat for Sonoma Valley (reaching 21,559 on Wednesday and 24,000 on Sunday)
- Home & Garden guide – water conservation tips and 1 full page color ad reaching 25,000
- Press Democrat - Water Awareness ads in May 2000
- Window Vinyl's
  - 10,000 "Hot Summer Days – Water At Night" vinyl's available for distribution
- Council for Community Television
- "Got Water" conference video– marketed through Novato and Petaluma chamber of commerce
- Talking Toilet Video – advertised fundraiser toilet giveaway
- Return of the Talking Toilet – recycling of old toilets
- Public Service Announcements – student produced water conservation messages

### **Sonoma County Crusher's Baseball 2000 Season**

- 360 – 30 second radio spots on KBBF 89.1 FM
- 2,000 Schedule magnets with "Please Conserve Water" message
- 8' X 32' Hot Summer Days – Water At Night message on outfield wall vinyl
- 8-1/2" X 11" Hot Summer Days – Water At Night message in Crusher's program
- 150,000 Hot Summer Days – Water At Night message on back of Crusher's schedule
- 45 on field promotions with Water Conservation T - Shirt giveaway
- 1 High Efficiency Washing Machine will be give away on Fan Appreciation Day, September 3<sup>rd</sup>

### **Rincon Valley Little League**

- Hot Summer Days – Water At Night message on outfield wall vinyl

### **Regional Fairs**

#### **Sonoma – Marin County Fair – 5 days, June 14<sup>th</sup> through June 18<sup>th</sup>**

- Staffed 10:00 am to 10:00 pm
- Promoted outside water conservation "Beat the Peak", drip display

#### **Marin County Fair - 5 days, June 30<sup>th</sup> through July 4<sup>th</sup>**

- Staffed 11:00 am to 11:00 pm
- Promoted regional understanding of water supply sources, indoor water conservation, drip irrigation and CIMIS stations (evapotranspiration)

#### **Sonoma County Fair – 14 days, July 25<sup>th</sup> through August 7<sup>th</sup>**

- Staffed 9:30 am to 10 pm
- Promoted water conservation, water education, recycled water, fisheries enhancement and wastewater treatment
- 3 High Efficiency Washing Machines given away by the Agency's Board of Directors on August 22<sup>nd</sup>
- 8,500 hose nozzles, 5,000 shower timers, 1,000 showerheads, 4,500 bathroom aerators, and 2,750 kitchen aerators distributed
- Miscellaneous water conservation literature and material distributed
- 28 water conservation t-shirts donated as prizes

### **Other Public Outreach**

Agency staff is often times available to assist water contractors in community events where water conservation representation is desired - examples of where we've been in the past few months includes:

- Earth Day – distribution of water conservation hardware and publications
  - Cotati – April 15<sup>th</sup>
  - Valley of the Moons Boys and Girls Club – April 19<sup>th</sup>
  - Santa Rosa – April 22<sup>nd</sup>
- Summer Splash – August 12<sup>th</sup>
- Regional Parks Celebration
- Urban Water Management Plan Public Meetings
  - Santa Rosa – Forestville – June 5<sup>th</sup>
  - Cotati – at City Council – June 14<sup>th</sup>
  - NMWD – at Board Meeting – June 20<sup>th</sup>
  - Petaluma – June 22<sup>nd</sup>
  - Sonoma and Valley of the Moon – June 27<sup>th</sup>
- California Landscape Contractors Association
- Water conservation program presentation – January 18th and May 16th
- Speakers Bureau – Agency staff speaking to region wide community service organizations
- Potter Valley facilities tour for local leaders and elected officials
- Environmental forum workshops each year

- Sonoma County Economic Development Board – “Got Water” conferences for business leaders
  - Santa Rosa – February 10th
  - Petaluma – March 22nd
  - Sonoma Valley – March 23<sup>rd</sup>
- Water Conservation Articles
  - Wine County Water Works (6 per year)
  - California Landscape Contractors Association (upon request)

#### **Water Conservation Materials**

- Hardware distributed since 1995
  - 15,000 Low Flow Showerheads
  - 12,500 Trigger Release Hose Nozzles
  - 50,000 Kitchen and Bathroom aerators
  - 17,000 Shorter Showers – 5 minute shower timers
- Printed Publications distributed since 1995
  - 2,000 Sunset “Great Conservation”
  - 7,000 Sunset “Water-Wise Gardening”
  - 1,500 Sunset “Garden Bonus”
  - 10,000 Sunset “Best New Plants”
  - 5,000 AWWA “Meters”
  - 10,000 AWWA “Water”
  - 10,000 AWWA “Leak Seeker”
  - 10,000 AWWA “Landscaping”
  - 7,000 AWWA “Inside Story”
  - 15,000 AWWA “Outside Story”

#### **BMP 08 – School Education Program**

The Agency offers the Water Education Program (WEP), free of charge, to all public and private schools within the Agency's service area (grades kindergarten through 6). The program provides direct instruction both in the classroom and at the Russian River field-study site. The WEP also serves as a resource (technical support, materials, supplies and participation in events) for all education levels, as well as the adult community.

The WEP consists of:

- Two full time permanent and one full-time temporary Information Specialists
- Direct instruction for classroom and field-study site
- Free curriculum and lending library
- Educator workshops
- Biannual educational newsletter – Hydro Herald to educator and other interested parties throughout the community
- Community outreach -- Wednesday Night Market, Earth Day Celebrations and other special events
- Adult tours of our pumping facilities and sanitation districts
- Bay Area Environmental Educational Fair (BAEER Fair) – Distributed information to educators
- Distribution of Water Education Calendar
- Green Brochure: “A Healthy Environment Begins at Home” distributed to all educators in Sonoma and North Marin counties
- Speaker Bureaus throughout the service area

## **BMP 12 – Conservation Coordinator**

The Agency has employed a full-time Water Conservation Specialist since September 1985. To date, staffing includes the following:

- Water Conservation Coordinator was hired in September 1999 and is responsible for: coordination and oversight of conservation programs and BMP implementation and other duties.
- 1<sup>st</sup> Water Conservation Specialist (Specialist) was hired in October 1985 to develop water education, public information and general Agency conservation programs;
- 2<sup>nd</sup> Specialist hired October 1996 to develop and administer the City of Petaluma and City of Rohnert Park's Water Conservation Programs and assist in general program implementation;
- 3<sup>rd</sup> Specialist hired July 1999 to develop and administer the North Marin Water District Program and assist in general program implementation;
- 4<sup>th</sup> Specialist hired September 1999 to administer the City of Rohnert Park Program, develop and administer the City of Sonoma and Valley of the Moon Water District Programs, and assist in general program administration;
- 5<sup>th</sup> Specialist hired August 2000 to assist with the City of Petaluma Program, develop and administer the City of Cotati Program, and assist in general program administration.

In addition to the above staff, the Agency has three Water Information Specialists that prepare and conduct water education programs. Management and engineering staff are also available to provide technical assistance and speak at various meetings, before interested councils, boards, service organizations, etc. on a variety of issues including water conservation, water supply planning and transmission system constraints and impairments.

## **CITY OF SANTA ROSA**

---

### **BMP #07 – Public Information Programs**

#### **Implementation:**

- maintains three public information distribution centers in City facilities;
- stocks and supply at least 18 different conservation publications to community groups and individuals on request at no cost to the customer;
- sends introductory conservation materials to all new customers;
- includes past year's usage and clear rate explanation on utility bill;
- provides speakers to local community groups (Chamber of Commerce, Rotary, home owners' associations);
- conducts annual Water Awareness Month campaign (May) including Water Conservation Awards at City Council;
- sponsors a water conservation poster contest in elementary schools for the water conservation calendar;
- provides an annual toilet leak kit mailing;
- place radio and newspaper advertisements for key programs;
- install and staff public market display on conservation topics;
- and coordinate with the Agency (wholesale supplier) and other utilities (PG&E).

**Implementation Schedule:** Completed: Santa Rosa will continue to implement this BMP.

**Program Effectiveness Evaluation:** Santa Rosa receives feedback from customers, compiles market surveys testing the customers knowledge of programs and receive requests for additional information and materials from customers.

**Water Savings Assumptions:** The City does not attribute actual savings to this BMP.

### **BMP #14 – Residential ULFT Replacement Programs**

#### **Program Effectiveness Evaluation:**

Savings as of 6/99 (note – these figures represent replacement of showerheads and faucet aerators as well as toilets)

Single Family – 18.5% average reduction in winter water use  
11,294,522 gallons per year

Multi-Family – 20.31% average reduction in winter water use  
14,986,925 gallons per year

Figures as of 7/00

11,888 participating accounts (excluding commercial)

24,234 toilets - city-wide program

1,699 toilets - pilot study

25,933 toilets

## **CITY OF PETALUMA**

---

### **BMP #01 - Water Survey Programs for Single-Family & Multi-Family Residential Customers**

**Implementation:** The City has developed a plan to implement a water survey program for 50 single-family residential customers. Program participants will be given a packet that contains a summary of the survey results, a recommended irrigation schedule and water conservation information. The free residential water survey includes the following elements for indoor and outdoor:

#### Indoor

- Check for water leaks, including faucets, and water meter.
- Check showerhead and faucet flow rates and offer to replace or recommend replacement.
- Check for water leaks and flow rates of toilet(s). Replace leaking toilet flappers and recommend replacement of toilets with greater than 1.6 gallons per flush.

#### Outdoor

- Check the operation of irrigation system and capabilities of existing controller(s).
- Develop a recommended irrigation schedule.

### **ET Paging Irrigation Controller Program**

An ET paging irrigation controller program will be offered free of charge to participating customers. The ET paging unit is a computer chip-embedded irrigation controller where the chip picks up a weekly broadcast, or paging signal, with local ET information and automatically adjusts the irrigation schedule in the controller. The program includes the following elements:

- Free ET paging irrigation controller(s)
- Installation of free ET paging irrigation controller(s)
- Station by station scheduling.
- Installation of free rain shut-off device(s).
- Measurement of landscape area.
- Broadcast signal fee paid for 7 months.

### **BMP #05 – Large Landscape Conservation Programs and Incentives**

**Implementation:** Petaluma is implementing Large Landscape Conservation Programs and Incentives for non-residential water customers. Program detail follows:

#### **Local ET Data**

A California Irrigation Management Information System (CIMIS) weather station #144 was installed at the Rooster Run Golf Course, Petaluma, California in October of 1999. This CIMIS weather station provides the evapotranspiration data needed to develop irrigation schedules for the Landscape Water Audit and Irrigation Incentive Programs.

#### **Landscape Education**

Annual water management training will be offered to City landscape staff, water department staff, local landscape contractors, golf course landscapers and local school district landscape staff.



### **Landscape Water Audit Program**

The Landscape Water Audit includes an inventory of sprinklers on each valve/circuit and catch-can tests to determine the precipitation rate and distribution uniformity of the sprinklers. The catch can volumes are measured, recorded and entered into software developed by the Irrigation and Training Research Center of Cal Poly. A report is prepared for the program participant with a proposed irrigation schedule for turf areas, based on Petaluma's evapotranspiration (ET). Irrigation/controller maps are also provided that identify the location of the sprinklers on each valve, their respective precipitation rates and distribution uniformity.

### **Irrigation Incentive Program**

A customized Irrigation Incentive Program was developed to assist non-residential water customers in improving the efficiency of their sprinkler systems. The City will pay for a portion of the labor and material costs of the irrigation equipment that will improve water use efficiency of existing irrigation systems.

**Implementation Schedule:** The Residential Water Survey Program began in August 2000 and the implementation schedule goal is 50 residential water customers audited.

#### **FY 1999/2000**

A Cal Poly instructor conducted a two-day training session for the in the 1999/2000 program year. The training session helped prepare the landscape professionals to perform site inspections, evaluate irrigation systems, and develop efficient irrigation schedules for drip, bubbler, micro spray and sprinkler systems. The majority of the course was spent in the field performing "landscape audits" and at the computer generating irrigation schedules with the audit software. Landscape water audits were performed at all parks, larger than 1 acre in size, on the City's west-side. Total audited turf-grass area was 15 acres. A pilot Irrigation Incentive project was completed at one park.

#### **FY 2000/2001**

Two water management training classes are underway: Plant Water Requirement and Reducing Water Waste. Petaluma plans to perform landscape water audits for irrigation systems on up to 30 irrigation controllers. Landscape audits include parks on the City's east side and the audits required by the Irrigation Incentive Program.

### **BMP #07 – Public Information Programs**

**City of Petaluma Implementation:** Public outreach activities include:

#### **Sonoma County Economic Development Board – "Got Water" conference for business leaders**

- Petaluma – March 22, 2000

#### **Urban Water Management Plan 2000 Public Meetings**

- Petaluma – June 22, 2000

#### **Sonoma – Marin County Fair – 5 days, June 14<sup>th</sup> through June 18<sup>th</sup>, 1998, 1999, 2000**

- Staffed 10:00 am to 10:00 pm
- Promoted outside water conservation "Beat the Peak", drip display

### **Council for Community Television**

- "Got Water" conference video-- marketed through Novato and Petaluma chamber of commerce
- Talking Toilet Video -- advertised fundraiser toilet giveaway
- Return of the Talking Toilet -- recycling of old toilets
- Public Service Announcements -- student produced water conservation messages

### **Media Marketing**

- Movie Theater Ads -- Beginning Labor Day 2000, 840 ads a week for seven weeks in Petaluma

**Water Savings Assumptions:** This BMP cannot be quantified.

## **BMP #09 - Conservation Programs for Commercial, Industrial, and Institutional Accounts**

**Implementation:** The City has two conservation programs for Commercial, Industrial, and Institutional (CII) accounts: Non-Residential Toilet Replacement Program and customized Commercial/Industrial Water Survey and Incentive Program.

### **Toilet Replacement Program**

The Non-Residential Toilet Replacement Program offers applicants two options for toilet replacement.

1. Direct-Install Option: where free fixtures (ULFT's, showerheads and aerators) are supplied and installed by a City-hired contractor.
2. Rebate Option: for customers who prefer to buy colored or custom-style equipment from a supplier and/or want to use their own contractor or qualified in-house maintenance personnel. Rebates are \$100 for a gravity-flush toilet and \$150 for a commercial-type power flush toilet.

### **Customized Commercial/Industrial Water Survey and Incentive Program**

The customized Commercial/Industrial Water Survey and Incentive Program is being developed through experience gained at selected demonstration projects. Petaluma's program will have the ability to consistently develop projects that save impressive amounts of water and money. Innovations for accomplishing these goals, include:

1. High-quality technical designs that follow a protocol beginning with process optimization.
2. Long-term partnership that encourages proper operation and maintenance of optimized systems (not just new equipment).
3. Monitoring and verification of savings.
4. Savings normalized for economic protection.
5. Full valuation of avoided water and wastewater costs.

**Implementation Schedule:** Petaluma will continue to implement this BMP as it is described by CUWCC.

**FY 1998/1999**

1. Non-Residential Toilet Replacement: 861 toilets high-water-using toilets were replaced in commercial, industrial and institutional buildings.
2. Industrial Survey & Incentives: A customized water survey was performed and financial incentives (*what amounts/what savings*) were calculated at Mishi Apparel Inc.

#### **FY 1999/2000**

1. **Non-Residential Toilet Replacement:** Petaluma is planning to replace 500 high-water-using toilets in commercial, industrial and institutional buildings.
2. **Industrial Survey & Incentives:** Mishi Apparel Inc. is implementing the first phase of the program, which includes replacing existing washing machines with front-loading, horizontal axis machines.

A second customized water survey demonstration site was selected for the program, Sola Optical USA, Inc., headquartered in Petaluma, (manufacturer of approximately 1/3 of all ophthalmic lenses worn in the United States). Instrumentation equipment (clamp-on flow meters, associated data loggers, and related data integration services) is being purchased to perform an extensive water efficiency evaluation.

#### **FY 2000/2001**

1. **Non-Residential Toilet Replacement:** Petaluma's Non-Residential Toilet Replacement Program long-term goal is to replace 50% or 1,825 high-water using toilets with new water-conserving fixtures in industrial, commercial, and institutional facilities. The City is planning to achieve this goal by replacing the remaining 464 high-water-using toilets within the 2000/2001 fiscal year.
2. **Industrial Survey & Incentives:** Mishi Apparel Inc. will begin Phase 2 of the program described in their survey report. A customized water survey will be performed and financial incentives will be calculated at Sola Optical USA. One or two additional sites will be selected for demonstration projects. The FY 2000/2001 Program began July 1, 2000 by City of Petaluma Council approval.

#### **FY 2001/2002**

1. **Non-Residential Toilet Replacement:** Petaluma will evaluate the effectiveness of this program before deciding to go after the remaining 50% high-water-using toilets.
2. **Industrial Survey & Incentives:** The demonstration projects will be evaluated and Petaluma will determine the steps needed to expand the Commercial Industrial Survey and Incentive Program to Petaluma's remaining 850+ commercial, industrial and institutional customers.

### **BMP #14 – Residential ULFT Replacement Programs**

**Implementation:** Petaluma implements programs for replacing existing high-water-using toilet with ULFT in single-family and multi-family residential units. Two toilet replacement programs are planned - the Special Event Fundraiser Program and the Rebate Program.

#### **FY 1999-2000**

There were 957 high-water-using toilets were replaced through a Special Event Fundraiser Program.

**FY 2000-2001:** The goal is to replace 1,000 additional high-water-using toilets by offering participants one of two options for fixture replacement: Special Event Fundraiser, and/or Rebate. The Residential ULFT Replacement Program is pending City of Petaluma City Council approval.

**FY 2001-2009:** The City's Residential Toilet Replacement Program goal is to replace another 5,000 high-water-using toilets in residential and multi-family dwellings.

## **NORTH MARIN WATER DISTRICT**

---

### **BMP #01 – Water Survey Programs for Single-Family & Multi-Family Residential Customers**

**Implementation:** NMWD's residential water use survey program for single-family residential customers began January 2000. In May 2000, 12,000 single-family customers were directly mailed a newsletter explaining District conservation programs. This newsletter included individual specific water use information during the prior year as compared to a typical single-family residential customer. Customers who participate in the fixture retrofit program receive individual inspection of their plumbing fixtures and free showerheads, faucet aerators and water hose nozzles. These devices are packaged in an attractive District bucket (suitable for other uses such as car washing).

Future direct mail newsletters will focus on individual water use and address leaks and irrigation use. Ultimately, customers in the top 20 percent of water use will be offered a free on-site water use survey. The Residential Water Survey Program costs and elements will be tracked and results summarized.

#### **Free residential water survey includes the following elements:**

##### **Indoor**

- Check for water leaks at meter.
- Check showerhead flow rates, faucet flow rates and offer to replace or recommend replacement as necessary.
- Check toilets for water leaks and flow rates, replace leaking toilet flappers and recommend participation in fixture replacement/rebate programs.

#### **Future additions to the Residential Water Use Survey Programs include:**

##### **Outdoor**

- Check the operation of irrigation system and capabilities of existing controller(s).
- Develop a recommended irrigation schedule and instructions for seasonal timer adjustments if appropriate.

##### **Report**

- Program participants will be given a summary of the survey results, a recommended irrigation schedule and additional water conservation information.

#### **Cash for Grass/Connection Fee Credits**

Rebates are available to existing customers willing to reduce the amount of turf grass area in their landscape. New customers receive a reduction in their connection fees by reducing the amount of turf grass in their landscape.

The District initially implemented the Cash for Grass Rebate Program in 1989. The program has reached 127 participants since inception. Cash for Grass will continue until a goal of 1,000 participants are reached. There have been 651 connection fee reductions given since 1989. This is a required program, without connection fee credits, for new customers since September 2000.

## **BMP #05 – Large Landscape Conservation Programs and Incentives**

**Implementation:** NMWD's Large Landscape Conservation Program (Program) includes:

### **Cal Poly Irrigation Auditing/Budgeting Training**

A Cal Poly instructor will conduct a three-day training session for the City of Novato's landscape staff, the Novato School District landscape staff, landscape contractors hired to maintain the landscape at Fireman's Fund and the City of Novato Cemetery's landscape staff. The training will help these professionals to perform site inspections, evaluate the efficiency and workings of irrigation systems, and provide schedules for irrigation systems. This class will be conducted in a computer lab using auditing and budgeting software and in the field performing landscape audits.

### **Landscape Water Budgeting Program**

After the Cal Poly training session is complete, NMWD staff will obtain landscape measurements from all participants designated irrigation metered accounts and produce evapotranspiration (ET) based water budgets for each site. Bi-monthly meter reads will be compared to the ET based budget. Poorly performing areas will be targeted for future audits.

### **Landscape Water Auditing Program**

Audits will be performed based on the budget performance. The audits will include an inventory of sprinklers on each valve and catch can tests to determine the precipitation rate and distribution uniformity. The catch can volumes will be entered into the software developed by the Irrigation and Training Research Center of Cal Poly. A report will be prepared for each site with a proposed schedule for each valve based on Novato's ET.

### **Irrigation Incentive Program**

NMWD will implement an incentive program to assist landscape managers at improving the efficiency of irrigation. Rebate programs will be available for customers upgrading their systems to improve watering efficiency.

In addition to the above programs, a California Irrigation Management Information System (CIMIS) weather station #63, is located at the Valley Memorial Park, Bugia Lane, Novato, California. This station was installed 1988 and has been consistently maintained by NMWD.

**Implementation Schedule:** NMWD plans to continue implementing this program. The following is an implementation schedule.

- **Cal Poly Irrigation Auditing/Budgeting Training**

NMWD will implement this training session during the 2000-2001 program. NMWD will provide additional training sessions for irrigation managers of large landscapes in the Novato service area.

- **Landscape Water Budgeting Program**

The Large Landscape Budget Program will be implemented in January 2001. All irrigation accounts should have water budgets by the end of the calendar year 2001. Accounts will be given a use comparison on their bills or in a separate letter to be given out bi-monthly.

- **Landscape Water Auditing Program**

The Large Landscape Audit Program will be implemented in January of 2001 after the Cal Poly Irrigation Audit/Budget training is complete. It will continue for ten years or until no less than 15% of Irrigation accounts are surveyed (audited).

- **Irrigation Incentive Program**

The Irrigation Incentive Program will be developed starting in the summer of 2001. It will be directly linked to the Irrigation Audit Program.

## **BMP #07 – Public Information Programs**

### **North Marin Water District Implementation:**

#### **Urban Water Management Plan 2000 Public Meetings**

1. North Marin – June 20, 2000

#### **Marin County Fair – 5 days, June 30<sup>th</sup> through July 4<sup>th</sup>, 2000**

2. Staffed 11:00 am to 11:00 pm
3. Promoted water conservation cooperatively with Agency and Marin Municipal Water District, Marin County.

#### **Public Outreach**

4. Earth Day Festival for Birkenstock Corporation employees, Novato, CA. - April 26, 2000
5. Community Access Television show, promoting water conservation in local real estate, February 3, 2000

#### **Media Marketing**

6. Headquarter Mounted Billboard – "Cash for Grass" program
7. Movie Theater Ads – Running for 29 weeks starting September in Novato
8. Newspaper and Printed Advertisements
9. Novato Advance Advertisements (2 Ads Reaching 20,000)
10. Mounted Portable Sign – "Don't be a Gutter Flooder"

#### **Direct Mail Newsletter**

11. Mailed to 12,000 customers in Spring, 2000
12. Depicts an individual water use graph for each customer
13. Newsletter to be mailed every Spring and Fall, thereafter.

## **BMP #13 – Water Waste Prohibition**

### **Waste of Water Prohibited**

- (1) Customers shall not permit any water furnished by the District for the following nonessential uses:
  - (i) The washing of sidewalks, walkways, driveways, parking lots and other hard surfaced areas by direct hosing when runoff water directly flows to a gutter or storm drain, except as may be necessary to properly dispose of flammable or other dangerous liquids or substances, wash away spills that present a trip and fall hazard, or to prevent or eliminate materials dangerous to the public health and safety;
  - (ii) The escape of water through breaks or leaks within the customers plumbing or private distribution system for any substantial period of time within which such break or leak should reasonably have been discovered and corrected. It shall be presumed that a period of seventy-two (72) hours after the customer discovers such a break or leak or receives notice from the District, is a reasonable time within which to correct such break or leak, or, as a minimum, to stop the flow of water from such break or leak;
  - (iii) Irrigation in a manner or to an extent which allows excessive run off of water or unreasonable over spray of the areas being watered. Every customer is deemed to have his water system under control at all times, to know the manner and extent of his water use and any run off, and to employ available alternatives to apply irrigation water in a reasonably efficient manner;
  - (iv) Washing cars, boats, trailers or other vehicles and machinery directly with a hose not equipped with a shutoff nozzle;
  - (v) Water for non-recycling decorative water fountains;
  - (vi) Water for new non-recirculating conveyor car wash systems; and
  - (vii) Water for new non-recirculating industrial clothes wash systems.
- (2) Exempt Water Uses. All water use associated with the operation and maintenance of fire suppression equipment or employed by the District for water quality flushing and sanitation purposes shall be exempt from the provisions of this section. Use of water supplied by a private well or from a reclaimed wastewater, grey water or rainwater utilization system is also exempt.

- (3) **Variances.** Any customer of the District may make written application for a variance. Said application shall describe in detail why applicant believes a variance is justified.
- (i) The General Manager of the District may grant variances for use of water otherwise prohibited by this section upon finding and determining that failure to do so would cause an emergency condition affecting the health, sanitation, fire protection or safety of the applicant or public; or, cause an unnecessary and undue hardship on applicant or public, including but not limited to, adverse economic impacts, such as loss of production or jobs.
  - (ii) The decision of the General Manager of the District may be appealed to the Board of Directors by submitting a written appeal to the District within fifteen (15) calendar days of the day of the General Manager's decision. Upon granting any appeal, the Board of Directors may impose any conditions it determines to be just and proper. Variances granted by the Board of Directors shall be prepared in writing and the Board of Directors may require the variance be recorded at applicant's expense.
- (4) **Enforcement.** Depending on the extent of the water waste the District may, after written notification to customer and after a reasonable time to correct the violation as solely determined by the District, take some or all of the following actions:
- (i) Telephone the customer to inform of the water waste violation including a specified period of time to correct the violation;
  - (ii) Personal contact with the customer at the address of the water service. If personal contact is unsuccessful, written notice of the violation including a date that the violation is to be corrected may be left on the premises, with a copy of the notice sent by certified mail to the customer;
  - (iii) The District may install a flow-restricting device on the service line;
  - (iv) The District may cause termination of water service and the charge for same shall be billed to the customer. Except in cases of extreme emergency as solely determined by the General Manager of the District, service shall not be reinstated until verified by the District that the violation has been corrected and all outstanding charges have been paid.

#### **BMP #14 – Residential ULFT Replacement Programs**

**Implementation Schedule:** NMWD's goal is to replace 8,000 toilets by the year 2005 with a 4,473-gallons/toilet/year savings and achieve 110 AFY (35.7 mg/yr) conservation savings. The implementation schedule follows.

##### **FY 1999-2000**

- As of September 21, 1999, 285 toilets were rebated through the Residential Toilet Rebate Program and The At Time of Sale ULF Retrofit.
- As of January 1, 2000, all homes in the Novato service area built before January 1, 1977, must have their original toilets, showerheads, and faucet aerators replaced when sold.

##### **FY 2000-2001**

The goal is to rebate 1,000 toilets through the Residential Toilet Rebate Program and the At Time of Sale ULF Retrofit. Adjustments will be made as experience dictates.

##### **FY 2001-2005**

The Water District's goal is to rebate 8,000 toilets. If projected goals are not being met, then changes to rebate amount or to the program may be necessary.



## **CITY OF SONOMA**

---

### **BMP #05 – Large Landscape Conservation Programs and Incentives**

**Implementation Schedule:** Sonoma began a large landscape conservation program in Fall 2000. Efforts began with a landscape water audit program for up to 10 City-owned parks. Sonoma's Water Conservation Program Manager (Program Manager) will organize a landscape irrigation-training course for Sonoma-designated and hired landscape staff. The Program Manager will then conduct audits that will determine precipitation rates and distribution uniformity of the sprinklers, grass type, root depth, and soil type. An irrigation schedule will be developed based on the evapotranspiration from CIMIS weather station No. 164. From this information, an irrigation controller map will be developed, detailing system layout and efficiency. Maps will be distributed to City of Sonoma staff for use at the respective sites. With information from this measure, priorities for irrigation system upgrades can be made.

### **BMP #14 – Residential ULFT Replacement Programs**

Sonoma, in cooperation with the SVCSD and the VOMWD, implements a program for replacing existing high-water-using toilet with ULFTs in single-family and multi-family residents.

**Implementation Schedule:** Sonoma will continue to implement this BMP.

FY 1996/1997

Two Special Event Fundraisers

FY 1997/1998

Special Event Fundraiser.

FY 2001-2009

The City will work with the SVCSD and the VOMWD to implement additional Special Event Fundraisers as budgets allow.

## **Appendix F**

### **Model Water Waste Prohibition Ordinance**

# MODEL WATER WASTE PROHIBITION ORDINANCE

ORDINANCE NO. \_\_\_\_\_

## AN ORDINANCE OF THE <CITY/DISTRICT> INSTITUTING WATER WASTE PROHIBITIONS

**SECTION 1.** The <City/District> does hereby ordain as follows:

The <Municipal Code/Regulations> of the <City/District is/are> hereby amended by adding Section \_\_\_\_\_ to \_\_\_\_\_, to read as follows:

### **"Section \_\_\_\_\_ - Water Waste Prohibitions**

**A. Purpose.** The purpose of this Section is to promote water conservation and the efficient use of potable water furnished by the <City/District> by eliminating intentional or unintentional water waste when a reasonable alternative solution is available, and by prohibiting use of equipment which is wasteful.

**B. Nonessential Uses.** No customer of the <City/District> shall use or permit the use of potable water from the <City/District> for residential, commercial, institutional, industrial, agricultural, or other purpose for the following nonessential uses:

1. The washing of sidewalks, walkways, driveways, parking lots and other hard-surfaced areas by direct hosing, except as may be necessary to properly dispose of flammable or other dangerous liquids or substances, wash away spills that present a trip and fall hazard, or to prevent or eliminate materials dangerous to the public health and safety;
2. The escape of water through breaks or leaks within the customers plumbing or private distribution system for any substantial period of time within which such break or leak should reasonably have been discovered and corrected. It shall be presumed that a period of seventy-two (72) hours after the customer discovers such a break or leak or receives notice from the <City/District>, is a reasonable time within which to correct such break or leak or, as a minimum, to stop the flow of water from such break or leak;
3. Irrigation in a manner or to an extent which allows excessive run off of water or unreasonable over-spray of the areas being watered. Every customer is deemed to have his water system under control at all times, to know the manner and extent of his water use and any run off, and to employ available alternatives to apply irrigation water in a reasonably efficient manner;

4. Washing cars, boats, trailers or other vehicles and machinery directly with a hose not equipped with a shutoff nozzle;
5. Water for non-recycling decorative water fountains;
6. Water for single pass evaporative cooling systems for air conditioning in all connections installed after <insert effective date of this ordinance> unless required for health or safety reasons;
7. Water for new non-recirculating conveyor car wash systems; and
8. Water for new non-recirculating industrial clothes wash systems.

C. Exempt Water Uses. All water use associated with the operation and maintenance of fire suppression equipment or employed by the <City/District> for water quality flushing and sanitation purposes shall be exempt from the provisions of this section. Use of water supplied by a private well or from a reclaimed waste water, grey water or rainwater utilization system is also exempt.

D. Variances. Any customer of the <City/District> may make written application for a variance. Said application shall describe in detail why applicant believes a variance is justified.

1. The <Manager of the Water Department/General Manager of the District> may grant variances for use of water otherwise prohibited by this section upon finding and determining that failure to do so would cause an emergency condition affecting the health, sanitation, fire protection or safety of the applicant or public; or, cause an unnecessary and undue hardship on applicant or public, including but not limited to, adverse economic impacts, such as loss of production or jobs.
2. The decision of the <Manager of the Water Department/General Manager of the District> may be appealed to the <Council/Board of Directors> by submitting a written appeal to the <City Clerk/District> within fifteen (15) calendar days of the date of the decision. Upon granting any appeal, the <Council/Board of Directors> may impose any conditions it determines to be just and proper. Variances granted by the <Council/Board of Directors> shall be prepared in writing and the <Council/Board of Directors> may require the variance be recorded at applicant's expense.

E. Enforcement and Fees. Depending on the extent of the water waste the <City/District> may, after written notification to customer and a reasonable time to correct the violation as solely determined by the <City/District>, take some or all of the following actions. Penalties, fees and charges noted below shall be established by resolution of the <City/District>.

1. Written notice to the customer of the water waste violation including a specified period of time to correct the violation.
2. Personal contact with the customer at the address of the water service. If personal contact is unsuccessful, written notice of the violation including a date that the violation is to be corrected may be left on the premises, with a copy of the notice sent by certified mail to the customer.
3. The <City/District> may install a flow-restricting device on the service line.
4. The <City/District> may levy a water waste fee to the customer.
5. The <City/District> may cause termination of water service and the charge for same shall be billed to the customer. Except in cases of extreme emergency as solely determined by the <Manager of the Water Department/General Manager of the District>, service shall not be reinstated until verified by the <City/District> that the violation has been corrected and all charges and fees have been paid.

## **SECTION II. SEVERABILITY**

If any section, subsection, sentence, clause, phrase, or word of this ordinance is for any reason held to be invalid, the validity of the remaining portion of this ordinance shall not be affected.

## **SECTION III. ENVIRONMENTAL DETERMINATION**

The <City/District> determines that this ordinance is a Class 7 categorical exemption under section 15307 of the California Environmental Quality Act, which exempts actions by regulatory agencies for protection of natural resources.

## **SECTION IV. EFFECTIVE DATE**

This ordinance shall become effective (30) days after the date of adoption.

PASSED, APPROVED AND ADOPTED this \_\_\_\_ day of \_\_\_\_\_, 2000, by vote as follows:

AYES: \_\_\_\_\_  
NOES: \_\_\_\_\_  
ABSTAIN: \_\_\_\_\_  
ABSENT: \_\_\_\_\_

<MAYOR or PRESIDENT of BOARD>

ATTEST:

<CITY CLERK or SECRETARY>

D:\MyFiles\0Jobs\SCWA Contingency Plan\Water Waste Ordinances\Model Water Waste Ord 2.wpd

Ordinance No. \_\_\_\_\_

Page 3 of 3

## **Appendix F**

### **Santa Rosa's Water Waste Prohibition Ordinance**

ORDINANCE NO. 3426

ORDINANCE OF THE COUNCIL OF THE CITY OF SANTA ROSA AMENDING SECTION 14-04.210 OF THE SANTA ROSA CITY CODE BY ADDING SUBSECTION (E) TO PROVIDE FOR DISCONNECTION OF SERVICE FOR WATER WASTE AND ADDING CHAPTER 14-21 ENTITLED "WATER WASTE REGULATIONS"

THE PEOPLE OF THE CITY OF SANTA ROSA DO ENACT AS FOLLOWS:

Section 1. Section 14-04.210 of the Santa Rosa City Code is amended by adding subsection (E) to read as follows:

"(E) If the utility customer who has received notice of violation of the water waste provisions of Chapter 14-21 fails to correct the conditions which caused the violation within fifteen days, or other reasonable time as determined by the Director of Utilities."

Section 2. Chapter 14-21 is added to the Santa Rosa City Code to read as follows:

**"Chapter 14-21**

**WATER WASTE REGULATIONS**

**Sections:**

- |                  |  |
|------------------|--|
| <b>14-21.010</b> | <b>Purpose.</b>  |
| <b>14-21.020</b> | <b>Water waste – Definition.</b>   |
| <b>14-21.030</b> | <b>Prohibition of water waste.</b>   |
| <b>14-21.040</b> | <b>Requirements for certain recirculating systems in new water services.</b> |
| <b>14-21.050</b> | <b>Notice and disconnection.</b>   |

**14-21.010 Purpose.**

The purpose of this chapter is to promote the efficient use of water by prohibiting water uses which constitute water waste. The sections of this chapter encourage reasonable use of the water supply by eliminating all intentional or unintentional water waste when a reasonable solution is available and discouraging use of equipment which is wasteful.

**14-21.020 Water waste – Definition.**

Water waste means:

- (A) Water use in outdoor areas resulting in runoff; or
- (B) Breaks or leaks in the water delivery system.

**14-21.030 Prohibition of water waste.**

A customer shall not allow water waste.

**14-21.040 Requirements for certain recirculating systems in new water services.**

New water services shall be equipped with recycling or reuse systems for the following water service receiving equipment: evaporative cooling systems, decorative water fountains, conveyer car washes and industrial clothes washers.

**14-21.050 Notice and disconnection.**

The Director of Utilities may issue a written warning to anyone who violates the provisions of this chapter. If a customer does not correct the violation within fifteen days of notification, or such other time as specified by the Director, the City may disconnect water service."

**Section 3. Severability.** If any section, subsection, sentence, clause phrase, or word of this ordinance is for any reason held to be invalid, the validity of the remaining portions of this ordinance shall not be affected.

**Section 4. Environmental Determination.** The Council determines that this ordinance is a Class 7 categorical exemption under section 15307 of the California Environmental Quality Act, which exempts actions by regulatory agencies for protection of natural resources.

**Section 5.** This ordinance shall take effect on the 31<sup>st</sup> day following its adoption.

IN COUNCIL DULY PASSED AND ADOPTED this 22nd day of June, 1999.

AYES: (6) Mayor Condron; Councilmembers Martini, Vas Dupre, Evans, Rabinowitsh, Wright

NOES: (0)

ABSENT: (1) Councilmember Runyan

ABSTAIN: (0)

APPROVED: \_\_\_\_\_

*Janet Condron*  
Mayor

ATTEST: \_\_\_\_\_

*Andrea Harper*  
Assistant City Clerk

APPROVED AS TO FORM:

*Rac*

City Attorney